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Building Bridges

Abstract book of the 23rd Annual Meeting of the European Association of Archaeologists 2017

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001 LOOKING BEYOND THE INTERVENTION OF THE ARTIST: CHOICE AND PREPARATION IN ROCK ART SITES

Theme: 6. Interpreting the archaeological record
Author: H. Nash, George (United Kingdom) - University of Bristol
Co-Author(s): Smiseth, May-Tove (Norway) - County Archaeology Department
Keywords: artist, contours, landscape, preparation, rock-art
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

It is now becoming increasingly clear that the surfaces on which rock art was produced formed an integral part of the visual performance. During the Upper Palaeolithic, painted imagery, such as animals, appear to have been deliberately positioned over a contoured surface in order to promote a 3D perspective.
Throughout many of the prehistoric rock art areas of the World panel design using animation and 3D perspective is considered by scholars to be a significant element and it is probable that sites were chosen specifically for this reason. However, in addition to what we term the contoured panelscape one also has to consider other elements that may have attracted artists to perform their work at specific sites; elements such as:

- the texture and colour of the geology of the rock panel;
- the [colour] patination value,
- the surface and pigment absorption value;
- the acoustic value in relation to the surrounding landscape; &
- the illumination value (if any) when viewed using natural or artificial light.

We invite scholars to present papers that promote the concept that the surface on which painted forms or the figure/motifs were engraved was an important element in choosing a rock art site. We welcome papers that include prehistoric, historic and contemporary examples. Participants will be invited to contribute to a session volume, to be published sometime after the conference.

01 HIDDEN HUNTERS: 3D NARRATIVES IN THE HUNTING SCENES OF BLACK DESERT ROCK ART

Author: Brusgaard, Nathalie - Leiden University (Presenting author)
Keywords: Petroglyphs, intentionality, hunting
Presentation Preference: Oral

The material turn in rock art research has seen a shift from studies on 'the image' to studies exploring the process of creating rock art, the rock itself, and the context. These studies are revealing that the surface of the rock, its qualities and elements, may have played an important element in the creation of rock art at specific places and in specific ways. New research on petroglyphs from the Black Desert in Jordan has yielded similar exciting results. Carved by nomadic pastoralists approximately 2000 years ago, the textual and pictorial engravings can be found across the basalt desert in Northern Arabia. Traditionally, only the texts have been used to study these desert peoples and the dominant theory has been that they were carved to pass the time during the long, idle hours of nomadic life. By extension, the rock art has been considered as a form of 'mindless' graffiti. However, now the first-ever systematic documentation and study of rock art from the Jebel Qurma region in the Black Desert, Jordan, is showing that there is large degree of intentionality in the choice of surface and site for the engravings. In this paper, I will explore this notion through several fascinating representations of hunting scenes. The hunting of wild animals is the most frequently depicted type of scene in this rock art. And a number of these appear to have been carved purposefully across multiple panels, creating a visual effect, an active 'narrative' in the scene. Exploring the use of surface and the boulders' situation in the landscape, this paper will argue for a new approach to understanding the Black Desert carvings and challenge the notion that there was no further purpose to their creation.

02 DECISION-MARKING IN SOUTH SCANDINAVIAN ROCK ART

Author: Dr Nimura, Courtney - Griffith University (Presenting author)
Keywords: Scandinavia, rock art
Presentation Preference: Oral

Makers of rock art in prehistoric Scandinavia were spoiled for choice: from vertical cliffs to large boulders to smooth rock outcrops, a wide variety of stone was available in the landscape. A number of factors would have contributed to the selection of suitable places to make rock art, and surely the rock's sensory and physical characteristics were among these. At some sites, the microtopography of the rock was seemingly used to represent elements of the environment, such as the sea or watercourses. These material metaphors could have affected the perception of the motifs associated with them.

Ship representations are the most abundant figurative motif in the region, and they are commonly used as evidence of Bronze Age belief systems based on the movement of the sun and other elements of the environment. Images of feet also abound, and they are sometimes physically connected to other iconic motifs, such as the ship. These prevalent motifs have been identified intermingling on rocks in southern Scandinavian Bronze Age–Iron Age rock art.

This paper proposes that both feet and ship motifs could be connected to a common Bronze Age worldview – one that has been suggested across southern Scandinavia – and uses fieldwork at two sites, Järrestad in southern Sweden and Boglösa in central Sweden, to discuss this idea. From visual punning to material metaphors, this paper looks at examples of specific decisions of rock art makers when adding to these panels. It also looks at certain physical characteristics of the rock that could have changed the relationship of these images to their environment, such as the position of the sun and proximity to the sea. These connections can also be explored in relation to a wider lexicon of rock art motifs and worldviews in the Bronze Age.

03 MARKING ROCK WALLS TO BUILD A CULTURAL LANDSCAPE: ROCK ART OF THE CENTRAL ANDES OF PERU.

Author: PhD candidate Perez Maestro, Carmen - Universidad de Alcala (Presenting author)
Keywords: Andean rock art
Presentation Preference: Oral

The amount of archaelogical sites that constitute rock art stations, suggests the importance of this activity in the human groups that moved and settled in the Central Andes from the archaic to the republican period. Its diversity and spaciousness assume that its production was associated with social practices of human groups in spaces of transition, habitation and socialization. Painted or engraved art constructs a cultural landscape through its disposition, technique and iconography. In this paper we will discuss about how these aspects are transformed, disappeared or perpetuated over time and in the different ecozones of the Central Andes of Peru.

04 THREE-DIMENSIONAL POLYGONAL MODELING OF BOULDERS WITH PETROGLYPHS FOR UNDERSTANDING OF THE FUNCTION OF THE SIKACHI-ALYAN ROCK ART SITE (RUSSIA)

Author: Devlet, Ekaterina - Institute of Archaeology, Russian Academy of Sciences (Presenting author)
Co-Author: Svoyski, Yuri - RSSDA Lab; Romanenko, Ekaterina - RSSDA Lab; Peshkov, Aleksandr - RSSDA Lab; Peshkov, Sergey - RSSDA Lab; Pakhunov, Alexander - Institute of Archaeology, Russian Academy of Sciences; Konakova, Ekaterina - RSSDA Lab; Timofeeva, Anastasia - Institute of Archaeology, Russian Academy of Sciences; Yushin, Evgeny - RSSDA Lab; Gabdulin, Rafkhat - RSSDA Lab; Kleymenov, Anton - RSSDA Lab; Laskin, Artur - Institute of Archaeology, Russian Academy of Sciences
Keywords: Rock art, photogrammetry
Presentation Preference: Oral

Sikachi-Alyan (UNESCO World Heritage Tentative List) is an outstanding rock art site known for its intrinsic character, cultural context and natural surroundings. Thirteen boulders with carvings were documented by means of digital photography with subsequent photogrammetric processing. In the course of the research, the problems of optimization of data acquisition techniques and processing, as well as the choice of optimal methods for surface visualization were investigated and solved. The uniqueness of the Sikachi-Alyan site from the standpoint of the methodology of documenting is its three features. (a) The "dynamic" nature of site, boulders with petroglyphs are located within the floodplain of the Amur River and annually undergo not only flooding, but also the impact of river ice during the ice drift. (b) Images exist not only on relatively flat areas of boulder, but also on surfaces of double curvature. (c) The technique of engraving is characterized by deep carving forming a bas-relief. These features make it extremely difficult to document and visualize petroglyps using traditional methods and require a specific approach to the use of 3D modeling. The application of interrelated set of methods and techniques optimized for the specific features of the monument made it possible to create detailed polygonal models of rocks with petroglyphs correctly oriented in space with respect to the horizontal plane and the direction to the north. The models of variable detalization were obtained, which allows to bypass the limitations of existing computer equipment. A number of new methods for visualizing petroglyphs was developed, including the transformation of polygonal model fragments into topographic models. These advanced approach made it possible to understand and interpret the preferences of ancient artists for the landscape location as well as choice of curved basalt surfaces. The study was funded by the Russian Foundation for Basic Research # 17-29-04389, 17-01-00511

06 EVIDENCES OF RELIEF EMPLOYMENT AND SURFACE PREPARATION IN KAPOVA CAVE VISUALIZED BY PHOTOGRAMMETRY, RTI AND IR IMAGING

Author: Pakhunov, Alexander - Institute of Archaeology Russian Academy of Sciences (Presenting author)
Co-Author: Prof. Dr. Devlet, Ekaterina - Institute of Archaeology Russian Academy of Sciences
Keywords: Cave art, imaging
Presentation Preference: Oral

Kapova cave with Upper Paleolithic parietal art is located in the Southern Urals, Russia. Paintings were made in red ochre of different tints. Various deposits were revealed on the walls, i.e. natural staining (from light yellow to red), massive clay formations, vermiculation's and calcite strata of different periods. Numerous vandal graffiti in charcoal, red paint and lipstick was removed during the conservation works in the past years.
For the studying of various activities associated with the paintings documentation using IR imaging, RTI and photogrammetry was performed. Choice of specific surfaces for paintings was traced by Infrared imaging - these areas appear white in comparison with dark walls formed by gray calcite with a high silicon content. Such deposits composed of pure calcite and looks like a blank canvas on the dark walls. Reflection transformation imaging revealed evidences of surface preparation - coralloid calcite deposits were removed by scrapping and paintings was made over the completely flat surface. Photogrammetry was used in two ways: at the initial stage, it allowed to document the relief of the walls. It was demonstrated that in some cases paintings were done with considering of the relief that add third dimension to the 2D paintings. Image enhancement combined to photogrammetry enabled to process textures as a regular image. On DStretch LDS enhancement images difference between natural deposits (red) and traces of paintings (purple) was shown. Complete documentation of the walls up to a height of 3 meters made it possible to reveal some unknown drawings and their decayed fragments. The study was funded by the Russian Foundation for Basic Research #16-01-00418, 17-29-04172

07 THE REPLICATATION OF CULTURAL LANDSCAPES: A CASE FOR THE ROCK-ART OF THE VALCAMONICA, LOMBARDY, NORTHERN ITALY

Author: Dr Nash, George - University of Bristol (Presenting author)
Keywords: dwelling, timber-framing, superimposition
Presentation Preference: Oral

The Valcamonica in the alpine region of Lombardy, northern Italy can boast one of Europe's largest rock-art areas with at least 300,000 individual engravings scattered over nine core areas of the valley. The bulk of this rock-art assemblage is firmly set within the Bronze and Iron Ages and includes warrior combat, hunting, herding and village scenes. Village scenes are usually superimposed over earlier hunting and combat scenes and include rectilinear field systems and free-standing, timber-framed buildings dating mainly to the Iron Age.

Fieldwork carried out by the author between 2007 and 2013 on panels in the Naquane National Park, Bedolina, and around the Alpine village of Paspardo has revealed a recurring theme whereby engraved buildings (and other figures associated with settlement) are located close to natural, glacially-eroded rock pools and linear gullies or glacial meltwater channels. Here, I ask the research question, is this relationship between engraving and these glacially-eroded features purely coincidental? Based on limited archaeological evidence, farmsteads and settlement would once have stood close to a watercourse but away from the floodplain, being safely located within the valley plateaus and glacially-con-

structed moraines. If there is an association between settlement and water during this later prehistoric period, is the artist attempting to replicate the village and the surrounding landscape using the natural topography of the rock panel?

This presentation will discuss the initial observations that include a series of engraved structures, presumably dwellings within the Valcamonica, and consider a possible link between panel topography and the distribution of later prehistoric dwellings in relation to actual topography and watercourses within an alpine landscape. For this, I have chosen a selected number of panels that characterises this artistic grammar and suggest that there is a unique and recurring relationship between engraved village scenes and certain natural elements of the panel.

08 ART AND THE INTIMACY OF THE CANVAS: HOW HUNTER/FISHER/GATHERERS ORGANISED THEIR RITUAL AND POLITICAL WORLDS THROUGH ART IN COASTAL NORWAY

Author: Dr Nash, George - University of Bristol
Co-Author: Ms Smiseth, May-Tove - County Archaeology Department, Hedmark, Norway (Presenting author)
Keywords: chaîne opératoire, narrative
Presentation Preference: Oral

Within central coastal Norway is an assemblage of engraved life-size zoomorphic figures that are found of exposed rock outcropping, usually close to open water. Many of these figures occur on glacially-polished rock, usually alongside former fjord edges or on domes of rock that once formed small islands surrounded by fjord water. Fieldwork analysis has shown that the chosen rock surface is usually angled in such way as to be enhanced by either a natural or artificial light source. Further intentionality is revealed in the way animal figures are incorporated into the micro-topography of the panel, and the way individual figures interact with other figures, sometimes creating a plethora of simple lines that form multiple narratives between same-specie and inter-specie figures.

In this paper we argue that a chaîne opératoire process is in operation whereby the artist - the decision-maker has carefully chosen the panel, prepared it and performed the act of engraving the art. We argue that the figures on some panels form a single engraving event but here, the artist has been meticulous in the way he or she has layered the various narratives in a sequential way, suggesting that the performance of the engraving event is itself a temporal narrative.

09 THE ANIMICY OF ROCK – ON THE MEANING ON ROCK CANVASES

Author: Professor Goldhahn, Joakim - Linnæus university (Presenting author)
Keywords: Rock art, intra-actions
Presentation Preference: Oral

Drawing on the influential work of Karen Barad, entitled Meeting the universe half-way, published in 2007, archaeology has recently come to focus on how human and nonhuman beings intra-acts in unfolding each others worldhoods or worldings. As Andrew Meirion Jones has argued in a topical paper, there are few instances where this notion is better suited for an exploration than within rock art research.
This paper focuses on how the canvas participated and intra-acted within the making of art. The paper explores engraved northern European Bronze Age rock art (ca. 1600–500 BCE), much of which was usually pecked, and investigates the Barad-notion of intra-action in relation to both portable and non-portable artwork. The former are most often found in relation to burial, while the latter is usually found on bedrock on open-air sites. In terms of research questions, what materialites were chosen, and why? Furthermore, how are the bedrock and stones participating in the creation of the images and how were they intra-acting? Finally, are there any clues on if or how these practices altered and changed over time?

003 ARCHAEOLOGICAL NETWORKS AND SOCIAL INTERACTION.TOWARDS AN APPLICATION OF NETWORK ANALYSIS AND NETWORK CONCEPTSIN SOCIAL ARCHAEOLOGY

Theme: 6. Interpreting the archaeological record
Author: Donnellan, Lieve (Netherlands) - VU University Amsterdam
Co-Author(s): Morris, Owain (United Kingdom) - Birbeck University London
Keywords: network analysis, interaction, material culture
Presentation Preference: Session with a key note speaker with contributions from discussants and discussion
Speaker: Prof. Dr. Carl Knappett

Formal network analysis has been increasingly applied during the last decade in archaeology, and made important contributions to understanding a variety of regional phenomena and inter-site interaction. However, it was acknowledged that network studies which focus on interaction between individuals or groups, rather than sites, are much more scarce. We claim that the potential of network analysis to contribute to the study of past societies, past social interaction and social change has not yet been fully explored. We aim to fill the gap by discussing how network analysis can contribute to understanding past human societies. The use of formal network approaches to study larger datasets allows a move away from the typochronological focus that has dominated archaeology. However, assumptions about the meaning of material culture and its role in society need to be made, in order to study the meaning of changes behind their particular configurations.
This session explores the theoretical and practical aspects of using network analysis for studying past human societies, social interaction, power, and social change. Preselected invited contributors discuss what social questions they are trying to address, what datasets they use, how they translate them into a network, and what conclusions they draw from the analysis of the network.
The goal of the session is to pre-discuss contributions that, after revision based on the feedback during the session, will constitute a book - to be published with an international publishing house. The key-note lecture will be delivered by Prof. Dr. Carl Knappett | Organized with the support of CLUE+

01 THINGS IN NETWORKS?

Author: Prof. Knappett, Carl - University of Toronto (Presenting author)
Keywords: networks, nodes, things
Presentation Preference: Oral

In archaeology, any interpretations of past social interaction have to be accessed via material proxies. But whereas previously archaeological theory characterised these materials as secondary to and reflective of the social, it is now commonplace for us to accord artefacts an active, constitutive role in social interactions. Thus, it is not just direct relations between people that are seen to form the social, but also the relations between people and things. Does this then make things in themselves social? If so, might we also surmise that relations between things (e.g. Hodder's thing-thing relations) are social? But how can this be, without any direct human relationship? And do things not also have other, non-social relations – why should we adopt an anthropocentrism that supposes the only significant relations that things may have are social ones? Evidently, there are many questions of this kind that come into play in our attempts to think through the imbrication of people and things in social interaction. They might be answered in different ways, depending on our theoretical assumptions. In this presentation I will address some of the issues that might arise in efforts to analyse formally some of these relations, as one might attempt, for example, with network methods. What kinds of things, and what kinds of relations between things, might be amenable to network analysis? And could some things resist abstraction as 'nodes' with clearly identifiable 'links' to other entities?

02 FUNERARY PERFORMANCE AND INTER-REGIONAL INTERACTION IN THE EARLY IRON AGE NORTHERN AEGEAN

Author: Dr. Donnellan, Lieve - Vrije Universiteit Amsterdam (Presenting author)
Keywords: networks, interaction, burials
Presentation Preference: Oral

Formal network analysis tools provide the most powerful measure to study in detail social interaction between archaeological populations. Most applications of archaeological network analysis have a decisive spatial component, but this paper provides an example of how formal network analysis can be used to study social interaction within and between groups, independently of absolute space or spatial positions of nodes. Thus, it contributes to the growing call for a more qualitative and complex application of network analysis in archaeology.
The paper explores a case study of well-known but badly understood interregional interaction between various populations. Past research has explained similarities in material culture in the Northern Aegean during the Early Iron Age in terms of a material koine and shared ethnic identity. Current materiality theories, however, compel us to reject such deterministic views on ancient societies.
Recent research (Donnellan, in press) brought the selective consumption of objects in the populations in question to light, as well as the relation of consumption with funerary performance.
A detailed understanding of the relative importance of inter-regional interaction on local populations can only be reached by looking at the populations and their interactions in terms of a network. Formal network analysis allows to establish the structural characteristics of the nodes within the network as well as the potential transformative power of bridges between subgroups. It permits to assess how easy information (new objects and new performance strategies) might have traveled in the population.
Funerary contexts are transformed in nodes and similarities in materiality of burial are considered in terms of ties. This very simple conversion of a funerary dataset in a network model allows for new insights in the nature of past interaction and materialised strategies.

03 TERRESTRIAL COMMUNICATION NETWORKS AND POLITICAL AGENCY IN EARLY IRON AGE CENTRAL ITALY (950-500 BC) : A BOTTOM UP APPROACH

Author: Mrs Fulminante, Francesca - Cambridge University (Presenting author)
Co-Author: Dr Lozano, Sergi - IPHES; Dr Prignano, Luce - Barcellona University; Mr Morer, Ignacio - Barcellona University
Keywords: Networks, modelling, urbanization
Presentation Preference: Oral

Terrestrial routes are essential for permitting inter-settlement cooperative processes and influence the development of past societies and their complexification (e.g. emergence of urbanism). At the same time, in order to be established, they need some level of cooperation. On the other hand, since their maintenance require a not negligible amount of resources, they are affected by competing interests.
More in general, transportation infrastructure can be regarded as an epiphenomenon of social interactions and interactions between societies and environments. In order to better understand emerging Latin and Etruscan urban polities and their interactions we modelled their terrestrial infrastructure networks to explore the underlying mechanism of their creation and maintenance.

In our models, settlements behave as node-agents: they are able to act on themselves and their environment and they communicate among themselves. Their behaviour is the result of their observation, their knowledge and their interaction with other agents. Data used are settlements (nodes) in Etruria and Latium vetus between the beginning of the Early Iron Age and the end of the Archaic Period; and terrestrial routes (links) hypothesized by scholars on the basis of later roads, topography and the position of existing settlements.

The results of the modelling suggest that a balanced coordinated decision-making process was shaping the route network in Etruria; whereas in Latium vetus a slightly unbalanced dynamics of power constitutes the most likely underlying mechanism. This fits very well with the picture elaborated by different scholars on the nature of power balance and dynamics in the two regions.

04 SNA BY ANY OTHER NAME: THE PRIMACY OF MATERIALS AND DERIVED NETWORKS IN ARCHAEOLOGY

Author: Dr. Mol, Angus - Stichting VALUE (Presenting author)
Keywords: Networks, Theory, Caribbean
Presentation Preference: Oral

The vast majority of networks in archaeology, whether they rely on spatial or other data, are what is known in network science as "derived networks". Rather than ties in archaeological networks being the result of any direct indication of node dependence — e.g. as in SNA: friend-networks, trade networks, etc. —, dependencies in archaeological networks

are derived from data that describe the traits of nodes and how these overlap with other nodes. This is one reason why spatial coordinates are so frequently used to scaffold many current archaeological network approaches. Moreover, it is also why so many non-spatial networks are in fact affiliation networks based on 2-mode networks — e.g. assemblage, distribution, or style networks.
At the basis of this lies the fact that archaeological social network heuristics are based on a complex mode of multi-network "tacking" as we analyse "matter that ties" (material systems) to understand "ties that matter" (social networks). As discussant, I will argue that, rather than looking for network data and theories that can provide us with "true" (or direct) social networks, we should embrace the multi-networked nature of our archaeological studies. Following up on Knappett's previous work, I will suggest that we should continue to build emphatically socio-material theories and methods for archaeological network studies, while using spatial relations as a baseline for the affordances and constraints that intersect with socio-material networks. To illustrate this I will draw on my own archaeological and ethnohistorical work from the Caribbean.

05 RECONSTRUCTING NETWORKS OF INFORMATION IN THE 3RD MILLENNIUM BC

Author: Dr. Bourgeois, Quentin - Leiden University (Presenting author)
Co-Author: Kroon, Erik - Leiden University
Keywords: Communities, Corded Ware
Presentation Preference: Oral

In the early 3rd Millennium BCE a radically new burial tradition emerged throughout north-western and Central Europe. This Corded Ware burial ritual was adopted over a vast area from the Wolga to the Rhine and highlights how prehistoric communities managed to communicate a complex idea over such a vast area. As such the spread of this idea can be seen as a Knowledge network.
In this paper I will argue that distinct communities of practice acted out this burial ritual and that by adopting such a practice perspective we can reconstruct how information on this burial ritual spread throughout the network. A cross-regional comparison of hundreds of burials through similarity indexes provides a means to explore this network and to highlight which burials show the greatest affinities with which other burials. Transforming these similarity indexes into different network representations then allows us to reconstruct the networks of information from 5000 years ago.
Through this methodology a clear separation between right flexed (commonly men) and left flexed burials (commonly women) can be observed in the level of similarity between burials and across regions. Left flexed burials are often more regional and idiosyncratic while right flexed burials are much more internationally oriented. This suggests that there were two distinct sets of Knowledge on the burial ritual that were probably organized along gender roles.

06 SOCIAL NETWORK ANALYSIS AND THE SOCIAL INTERACTIONS THAT DEFINE HOPEWELL

Author: Dr. Hill, Mark - Ball State University (Presenting author)
Co-Author: Dr. Nolan, Kevin - Applied Anthropology Laboratories, Ball State University; Dr. Seeman, Mark - Kent State University
Keywords: Hopewell, Networks, Exchange
Presentation Preference: Oral

Between approximately AD 50 and AD 350, the Scioto Valley of south central Ohio was the center of a major development in the history of North America known as Ohio Hopewell. The communities that made up this phenomenon engaged in the construction of large and elaborate earthworks and mounds, participated in social networks that brought exotic raw materials from the Great Lakes, the Gulf Coast, the Appalachians and the Rocky Mountains to the Ohio Valley. Yet there is no one "Hopewell"; the many Hopewell groups in eastern North America are best characterized by variable participation in a variety of information and goods exchange networks. Scales of participation range from the household level, to regional scales, and ultimately to broader networks that combine these diverse societies into what archaeologists may recognize as "Hopewell." However, until explicit and robust methods of analysis are applied to these problems, we will be unable to grasp the complexity and detail of each of these overlying networks. This study uses Social Network Analysis (SNA) to examine the social connections that unite and define these communities at multiple scales, from local to continental distances, by examining how people obtain and use various materials including stone for tools, ceramics, and copper. Our results reveal unexpected meso-scale connections among domestic and ceremonial sites that force a re-evaluation of Scioto Hopewell and their neighbors.

07 MARBLE NETWORKS: SOCIAL INTERACTION IN HOUSES AT POMPEII

Author: Dr Barker, Simon - King's College London; British School at Rome (Presenting author)
Co-Author: Dr Ward, Courtney - Hunter College; Dr Perna, Simona - Independent Researcher
Keywords: Pompeii, Marble, Networks
Presentation Preference: Oral

The use of imported marble as a decorative material is almost synonymous with elite domestic display in the Roman world. Pompeii is an ideal place to examine the demand for and use of marble, as each city has numerous well-preserved pavements from the first century BC to the first century AD with marbles from all over the Mediterranean. The importance of marble decoration in domestic contexts at Pompeii (and Herculaneum) is evident from the display of both real and painted imitation marble. This paper will produce a network-based analysis of marble use throughout Pompeii. Marble is a visual object – its visibility is a central aspect of its social significance and a key aspect in understanding the social networks of its users. As such, this paper seeks to examine how people interacted with marble decoration.

Our network model will examine individual houses as nodes. The model will consider a number of questions to assess the impact of "social-ties" on the spread of marble at Pompeii. By making assumptions about room function (public or private) we will examine if rooms that were more visible to visitors influenced the spread of a style around the town. How did seeing marble in a neighbour's house influence another individual to acquire a similar type and/or style? We also want to examine to what degree the spread of marble around Pompeii is the result of mutual awareness and therefore, most likely a consequence of direct contact between house owners. Therefore, using a social network-analysis methodology, we examine to what degree houses sharing the same type of marble can be said to have a relational tie to each other.

Overall, the paper seeks to use the data gathered from comphrensive survey of marble-use at Pompeii to examine how marble formed an essential component of social interaction.

08 A "PRINCELY" NETWORK? ELITE INTERACTION AND SOCIAL CHANGE IN CENTRAL AND SOUTHERN ITALY.

Author: Morris, Owain - Birkbeck College, University of London (Presenting author)
Keywords: Networks, Campania, Tombs
Presentation Preference: Oral

Founded in the mid 8th century BC on the Bay of Naples, Cuma is assumed to have been predominantly Greek in character and constituted some form of colonial settlement (D'Agostino 2006, Cerchiai 1995). An extremely ostentatious burial at Cuma (Fondo Artiaco 104) is believed to have inspired the so-called 'Princely tomb' phenomenon in Italy. According to this widely-held view, similar burial types spread first from Greece into Campania and then onto Lazio and Etruria. Current interpretations of this elite funerary culture over-privilege the Greek role and rarely explore the social contexts or actors involved in the movement of such ideas. Seeking to redress this imbalance, this paper will examine a sample of these 'princely' burials to produce a network based on their grave good assemblages. The apparent Greek influence over this funerary culture will also be analysed. As the theme of this session indicates, the spatial has tended to dominate over the social in archaeological applications of Network ideas (Knappett 2013, Collar et al 2015). I aim to go beyond a mere geographical network of the connections these burials had, so as to identify the contexts this funerary culture was exchanged in and the social actors who enabled this material mobility. Consideration will also be made as to the frequency of this contact and how certain individuals may have acted akin to Granovetter's (1973, 1983) weak ties to provide the 'princes' access to this orientalizing material culture.

09 NETWORKS AND SOCIAL REALITIES IN THE LATE BRONZE AGE SOUTHERN ADRIATIC

Author: Dr IACONO, Francesco - University of Cambridge (Presenting author)
Keywords: Bronze Age, Mediterranean
Presentation Preference: Oral

Although currently burgeoning, networks application to archaeology have often fluctuated in a social vacuum where methodologies adopted have paid little attention to societies and their internal differentiation. What is the role of networks of interaction in favoring or hampering social change? How can we explore their significance feeding such insights back into a more holistic understanding of broad connectivity patterns? In this paper I will try to explore these questions by the means of an innovative theoretical approach that merges networks with radical social theory. I will support my theoretical discussion with a case study related to the Late Bronze Age of the Southern Adriatic area. Located at the interface between worlds as different as the Early States of the Eastern Mediterranean and the Kin Ordered small scale societies of Italy and Europe the Southern Adriatic represent an ideal benchmark to investigate the interplay between network and society during the Late Bronze Age.

10 A COMPLEX BEADWORK. STRINGING TOGETHER EARLY MEDIEVAL EXCHANGE.

Author: Professor Dr Sindbæk, Søren - Aarhus University (Presenting author)
Keywords: Artefacts, networks, trade
Presentation Preference: Oral

The burial customs of 8th-10th century CE Scandinavians have left a record of hundreds of mostly female graves containing rich dress ornaments, often incorporating a wide variety of glass and stone beads. They display a panorama of beads produced in regions ranging from the Indian Ocean to Scandinavia, and somehow transported, exchanged, collected, and at one point buried as a closed assemblage. In a classic analysis of this material "Trade beads and bead trade" (1977), Johan Callmer defined the typology, groupings, and chronology of early medieval glass beads, which remain widely used across the world. This was accomplished almost entirely by means of hand-calculations. Today formal network analysis presents a compelling tool for re-evaluating his findings with regards to the association of the bead-types. This paper discusses the results of a re-analysis. The results show how shifting Eurasian trade-patterns can be untangled from the adornments of Viking Age women, but also how these trends are interwoven with non-spatial patterns revealing the aesthetic perceptions and cultural identities of Viking Age people.

11 IDENTITY FORMATION OF LATE URNFIELD ELITES AS REFLECTED BY FUNERARY STATUS REPRESENTATION

Author: Deicke, Aline - Academy of Sciences and Literature | Mainz (Presenting author)
Keywords: networks, social archaeology
Presentation Preference: Oral

The late Urnfield period (Ha B3) presents itself in the archaeological record as a time of political unrest and conflict. Apart from the appearance of fortified hill-top settlements, the end of the Alpine lakeside dwellings and the influx of the so-called "thraco-cimmerian" complex from the East, this is especially evident in the re-emergence of rich burials. After a shift of deposition activities towards hoards in the middle of the Urnfield period, status and prestige are again expressed in highly individualized funeral inventories that rely on established traditions as well as new trends and innovations. Thus, these graves allow a glimpse into the power struggles that resulted in the standardized hierarchical social structure of the subsequent Hallstatt culture.
Based on Keller's concept of strategic elites, the elite identity expressed in these inventories is understood as intersecting and multi-faceted, and its creation and consolidation as a process realized and negotiated in the complex interplay between the main actors of this period. Therefore, network analytical methods seem to suggest themselves as a tool to study elite identity as reflected in the funeral status representation of Ha B3.
The analysis focuses on a set of 64 rich graves located in the area of the Urnfield Cultures that covers the zone north of the Alps up to Middle Germany, between Eastern France and the entrance of the Carpathian Basin. In a two-mode network, they are set against a selection of object types that categorize the goods found in the burials. This main graph is complemented by additional networks focusing on further aspects such as cultural affiliation.

12 USING INTER-SITE RELATIONSHIPS DURING MIDDLE BRONZE AGE CYPRUS TO EXPLAIN SOCIAL CHANGE: A SOCIAL NETWORK ANALYSIS PERSPECTIVE

Author: Mr. Dalkilic, Emre - Bilkent University (Presenting author)
Keywords: Cyprus, social change
Presentation Preference: Oral

During the 500 year period of Middle Bronze Age in Cyprus (from Early Cypriot III to Middle Cypriot II which roughly coincides to 2200 – 1700 B.C.), a change can be seen in the social structure of the island, leading to increased social complexity. The relative insularity of Cyprus during this period provides the perfect opportunity to construct a Social Network Analysis model. Since a center of any kind cannot be attested to this period, this paper uses Social Network Analysis to explain the changing social structure of the island based on inter-site relationships. Three main types of pottery are used as inputs to form the initial network model: (1) Red Polished which is handmade and found throughout the island, (2) White Painted which is common in the north and north-east parts of the island and is produced domestically, and (3) Drab Polished which is common in the south and south-west and is produced in the same region. As the intensification of copper production seems to be inducing the social change, the distribution of copper is used as an input to form the final network model. The datasets of the pottery types are formed on the basis of their presence and density in the sites, and the datasets of copper artifacts are formed on the basis of their relative density among different sites. Based on the Social Network Analysis performed by UCINET, this paper proposes that three different regions were present on the island with minimal centralized control and social change in these regions were driven by the accessibility of copper resources.

13 WEAVING WOMEN: USING ONTOLOGIES TO ANALYSE SOCIAL NETWORKS OF TEXTILE MANUFACTURE IN MAGNA GRECIA

Author: Professor Foxhall, Lin - University of Liverpool (Presenting author)
Keywords: textiles ontologies networks
Presentation Preference: Oral

'Tracing Networks', funded by the Leverhulme Trust (2008-2013), was a research programme consisting of nine projects across archaeology and computer science. Our core research questions were 1) how did knowledge, especially knowledge of how to make things, move around the ancient Mediterranean and further into areas beyond Aegean and 'classical' cultures, and 2) how might the networks of knowledge discovered by archaeologists be deployed by computer scientists to find new templates and metaphors for moving knowledge in the digital world?
One of these projects focused on how loom weights, textile tools which could be identified with women's and their activities could be deployed to track networks of women across the Greek and indigenous cultures of southern Italy between the eighth and third centuries BCE. This paper explores the capabilities of ontologies, using Protégé software, for identifying and representing networks. In contrast to traditional databases, ontologies make it possible to relate objects and elements or properties of objects to other, and to express the degree of relatedness. In this case study, ontologies have been used to track relationships between decorative and functional elements of loom weights across landscapes and over time, as well as across different cultural and craft traditions. This makes it possible to track networks of women exchanging knowledge of textile manufacture.

14 CONNECTED MINDS - IDEOLOGICAL NETWORKS OF THE BRONZE AGE

Author: Autenrieth, Sabrina N. - Faculty of Archaeology (Presenting author)
Keywords: networks, depositions, wet/dry
Presentation Preference: Oral

The Rhenish river landscape is one of the best known examples of the excessive use of depositional practices of objects in rivers during the Bronze Age. In this region, the opportunity is given, to compare a variety of depositional practices in wet and in dry contexts, including graves, that have so far never been studied together. Using Social Network Analysis, it is to be examined how depositions were structured and to what extent a common ideology of depositional practices has been shared within this region. This analysis will not only readjust the previous one-sided focus on river finds, but also reveal whether objects deposited in dry areas represent a practice steered by ideas and motivations contrasting to those of river finds.

15 NETWORK ANALYSIS AS A TOOL TO EVALUATE REGIONAL PARADIGMS

Author: PhD Kellberg Nielsen, Trine - Aarhus University (Presenting author)
Keywords: Network, Scandinavia, Neanderthal
Presentation Preference: Oral

History of research and archaeological debates has the potential to distort the archaeological empirical record through biased approaches and self-perpetuating assumptions. In this way, regional paradigms are formed through the historical attention given to the specific topic in question. Assumptions on Neanderthal occupation in marginal/peripheral areas, is a good example of a topic that has been strongly affected by its history of research. This is in part due to the often highly controversial nature of the finds. Examples of this can be found in Scotland, Lithuania and the islands in the Aegean Sea. The present case-study is from Scandinavia, addressing exactly how historical publication strategies, author status and author interaction have shaped persisting paradigms regarding Neanderthal occupation in this region. Citation network analysis is used to investigate the dynamics of the research field using publications as a proxy. Scandinavia presents a highly suitable case-study because it is empirically restricted, but similar studies could be envisioned for other relevant regions. The dataset comprises all publications published between 1800 and 2015 on the topic of Pleistocene human occupation in Scandinavia. The types of publication range from scientific research to newspaper articles. This dataset is used to investigate author clusters, citation ranking, time of publication, position in the debate, regional focus and status of main author. The analysis reveals remarkable patterns and structures in the Scandinavian debate which is argued to be highly influential for the formation of the current paradigm that Neanderthals did not occupy this region.

017 THE FUTURE OF MUSEUM ARCHAEOLOGY IN EUROPE

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author: Skeates, Robin (United Kingdom) - Durham University
Co-Author(s): Colpo, Isabella (Italy) - University of Padova
Keywords: museums, collections, professional, future, archaeological
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

This session is intended to act as a forum in which to debate a range of 'big' questions and challenges facing museum archaeology across (and beyond) Europe:

Is the future of museum archaeology safe? Will museum archaeology retain its distinct professional identity? Will professional standards in museum archaeology become more universal? Who will pay for museum archaeology and conservation? How much political and popular support can museum archaeology count on? How successfully will archaeological site museums compete with other tourist attractions? Will traditionally disenfranchised groups be persuaded that museum archaeology matters? Will the illicit trade in antiquities ever be defeated? Will repatriation requests decline? Will museums cease to collect and display human remains? Will archaeological collections continue to inform and inspire future generations? What new stories about past people will result from collections research? Will museum designers create more effective, engaging, and enjoyable archaeological exhibitions? What new messages will museum displays present and visitors learn about the past and its relation to the present? What will publics around the world expect of museum archaeology?

Within this intentionally broad framework, our session will focus on some key themes relating to museum collecting and collections of archaeological artefacts and sites, and their potential to represent new narratives about past and present-day societies.

01 SESSION INTRODUCTION: THE FUTURE OF MUSEUM ARCHAEOLOGY IN EUROPE

Author: Professor Skeates, Robin - Durham University
Co-Author: Dr Colpo, Isabella - Padova University (Presenting author)
Keywords: Museums archaeology future
Presentation Preference: Oral

This paper presents an overview and commentary on the papers in this session, and sets them in a wider context of recent developments in museum archaeology around the world.

02 MUSEUM ARCHAEOLOGY IN THE 21TH CENTURY: THE CULTURAL BIOGRAPHY OF THINGS

Author: Dr. Mater, Benoît - Limburgs Museum (Presenting author)
Keywords: interpretation material culture
Presentation Preference: Oral

Who owns the past? Museums preserve, interpret and promote the cultural inheritance of humanity. For many years, interpretation of the past has been an exclusivity of (academic) specialists. In our present-day participation society, museums search for new ways to involve the public in an active way. The remote past is often seen as far away, and difficult to connect with. Museum archaeologists may learn from the way immaterial heritage is incorporated in modern communities, a vivid and dynamic interpretation. Interpretation of archaeology by the public: just another chapter in the biography of (archaeological) things.

03 DO WE STILL LIKE ARCHAEOLOGICAL MUSEUMS? MATTERS OF COMMUNICATION AND ITALIAN MUSEUMS

Author: Dr. Tarantino, Chiara - Università di Pisa (Presenting author)
Co-Author: Prof. Donati, Fulvia - Università di Pisa
Keywords: public perception communication
Presentation Preference: Oral

This paper opens a reflection on the degree of attraction that museums and archaeological exhibitions exercise over the public, according to the results of recent analysis of statistics and personal researches. If the collected data seem to go in favor of modern art exhibitions rather than archeology, this may depend as much by museographical issues as the public's perception of archeology.
No doubt archeology is attractive to people. Anyway, this appeal is usually connected to some kind of aura of mystery and adventure - attributed to discovery and the profession of archaeologist -, leading to a widespread curiosity about this subject that infrequently turns into real interest. This is definitely aided by a wide journalistic and documentary production pseudoscientific that seems the only one able to reach the public through magazines, television programs and the internet. We can therefore say that the distorted relationship - or at least superficial - with archeology depends only on that or should we honestly reflect on the way specialists communicate?
The next question concerns museums specifically. What does it make visiting an archaeological museum enjoyable or unattractive, so much as to affect negatively the repetition of the experience? Much has been written in general about the value and function of museums in today's society, but in this paper, we want to discuss the specific reality of archaeological museums and the possible scope for action.

04 CONTEMPORARY MUSEUMS OF THE CLASSICAL ART - BRIDGES OF MEMORY OR TEMPLES OF THE MUSES?

Author: Dr. Bugaj, Ewa - Institute of Archaeology (Presenting author)
Keywords: ancient art museum
Presentation Preference: Oral

A problem how to make dynamic and interactive collections of the classical art will be a subject of my paper. Contemporary Western museums are institutions reaching large and diverse social groups, and number of visiting them is constantly raising. This opens up new possibilities and poses various threats as well.
Traditionally the museum functioned as a cultural authority and was based as a guardian of valuable collections that were visited, researched and described by specialists – the museum was a collection for study with the results announced for the interested in them. However contemporary societies are changing very quickly and people don't want to listen to one narration about the past, but are interested in various stories and diverse aspects of them. We can observe growing need for multiple voices and awareness of the other perspectives in telling story about antiquity.
How ancient art museums deal with the problem? I would consider the question mainly on the example of the ancient sculpture exposition. We should notice that ancient sculpture derived their meaning and worth to a large extent from the archaeological context within which they functioned and/or were found. But this context is neither unambiguous nor static, but rather dynamic and constantly in motion.
I would argue after Laurajane Smith (2011) that the ancient art museum collections should function as dynamic heritage, linked to individual and collective memory.

05 DAYS OF FUTURE PAST: A BACKWARDS GLANCE AT THE FUTURE OF MUSEUM ARCHAEOLOGY

Author: Mr Hall, Mark - Perth Museum & Art Gallery (Presenting author)
Keywords: museums, archaeology, future
Presentation Preference: Oral

This paper will seek to paint a broad picture of some possible future directions of museum archaeology. It will be rooted in present day threats and opportunities and will seek to make comparisons with how the future of the discipline looked when the Society of Museum Archaeologists (now the Society for Museum Archaeology) considered it on the eve of a new relationship with Europe, the Maastricht Treaty. It will seek to range over some perennial favourites (including collecting issues [Treasure Trove, human remains and storage] and loss of expertise) and to cover some new aspects including the Scottish Archaeology Strategy and cinematic visions. And all in 15 minutes!

06 DIGITALLY PARTICIPATED CURATORSHIP: CHARTING FUTURES FOR MUSEUM ARCHAEOLOGY

Author: Dr Bonacchi, Chiara - University College London (Presenting author)
Keywords: participatory, digital, curatorship
Presentation Preference: Oral

This paper charts possible futures for museum archaeologies that leverage the transformative power of participatory practices enabled by the on- and -off-line application of an array of digital methods (Simon 2010, Bonacchi 2017). How are these participatory approaches re-shaping organizational policy and workflows? How are they impacting on the 'research environment', particularly at the interface between 'world' archaeology and archaeological science, on the one hand, and public archaeology, digital heritage and museum studies on the other? What are the principles behind 'successful' uses of crowdsourcing, social media, fora and other platforms that support the activities of communities of interest and practice which revolve around archaeological museums? How can 'success' be conceptualised and measured, and how does it translate into positive change for people 'inside' and 'outside' museums? Ultimately, can digitally participated curatorship enhance the social agency of archaeological museums? These are the questions that I will address and reflect upon, drawing on the longitudinal analysis of case studies from different European countries. Special attention will be given to the UK and Italy, and to the examples of the British Museum and the Museo Egizio of Turin.

07 DACTYLIOTHECAE TODAY

Author: Full Professor Micheli, Maria Elisa - University of Urbino (Presenting author)
Keywords: Dactyliothecae, Museums, Gems
Presentation Preference: Oral

Engraved gems, splendour for the gods; engraved gems, glory to the kings; engraved gems, mira et magica; engraved gems, high beauty and simple grace; engraved gems, precious returns: there are a few examples (and I could go on), with which the ancient engraved gems were most recently commented on and presented to the public. The keywords insist on the value, the spectacular nature and the wonder of these minutes and fines objects. But, the point is: how it is possible today to expose in a Museum a glyptic collection and make understandable its many meanings, abandoning stereotyped formulas? In fact, the intaglios and cameos interpret the needs and expectations of their owners, expressing them visually: gems are the most intimate testimonies of public and private life in Antiquity and are the main medium for the diffusion of classical art (they can anticipate what happens in later centuries in both stylistic and iconographical tastes), since they are so readily portable and they could be carried as valuables as gifts as means of propaganda or even as personal tale-memory. The paper aims to discuss the issue, considering the historical dactyliothecae and the gems from contexts.

08 MUSEUM ARCHAEOLOGY COLLECTIONS IN ENGLAND: ARE MUSEUMS RUNNING OUT OF SPACE, STAFF....AND TIME?

Author: Miss Rawden, Anooshka - Society for Museum Archaeology; Science Museum Group (Presenting author)
Keywords: #museum #archaeology #collecting
Presentation Preference: Oral

One of the most significant issues effecting museums collecting archaeology in England is the crisis point that has been reached in terms of collecting capacity, expertise loss and reduced investment. This is nothing new – as the Subject Specialist Network for British Archaeology in the UK, the Society for Museum Archaeology, often received news of cuts, closures and cessation of archaeological collecting before it becomes public knowledge. However, it was not until Historic England provided funding to gather concrete data on the impact of the economic downturn that we can now effectively benchmark a number of issues and map the direction of travel that the museum archaeology sector is facing. The Society surveyed museums in England in order to assess a number of key areas of concern. The results revealed a 30% reduction in staff in addition to a reduction in

the number of museums collecting. Lack of space was the most cited reason, referenced by 91% of museums, closely followed by shortage of expertise. Some of the results make stark reading and commonly re-iterated solutions have been offered, from "collect less" (we already do), to "stop collecting altogether" (some already have). Archaeology is unlikely to be the root cause of all museum storage issues and therefore not alone in the need to find solutions. From a purely archaeological perspective, however, the answer may lie in the oft-wished for joined-up legislation regarding statutory access archives. Legislation can be hard won, so what are the answers? How can museums secure statutory support? How can museums benefit from the recovery seen within the UK commercial archaeology sector, which has reported a 20% increase in paid employees in 2016? How can we convert the huge public appetite for archaeology into something more concrete for the sector's future– investment in the 'infrastructure' of collecting?

09 ARCHAEOLOGICAL MUSEUMS IN POLAND: NEW CHALLENGES, NEW CONTEXTS, NEW SOLUTIONS

Author: Mr Pawleta, Michal - Institute of Archaeology (Presenting author)
Keywords: museums, new museology
Presentation Preference: Oral

In this presentation I look at how archaeology museums function in Poland today. I analyse whether and how they adapt to the current cultural and market conditions. I suggest that the old way of looking at museums as temples of high art has undergone radical transfor-mation, it is possible to observe changes in the forms and ways of exposition, and the use of multimedia techniques in museum exhibitions. These changes, the result of developments in the contemporary world, challenge museums and influence their transformation.
Significant changes observed in archaeological museums in Poland are are not changes in planned curricula or extensive theoretical foundations but rather the effect of their practical adaptation to new socio-political and in particular economic conditions, especially market de-mands and visitor expectations as well as the need to be competitive. The trends discussed will be illustrated by selected examples which reveal certain noticeable trends in archaeology museums; educational projects, including the introduction of reconstructions, reenactments, para-theatrical events, museum lessons, and also aspects of the commercialisation of museums today. I want to see them as aimed at enabling museums to better fulfil their social mission in society within whose framework the museum itself functions.

10 BRESCIA (ITALY), MUSEUM OF THE CITY AND ARCHAEOLOGICAL AREAS: HISTORY, RELATIONSHIP AND DEVELOPMENT'S PROJECTS

Author: Dr. Di Corato, Luigi Maria - Fondazione Brescia Musei
Co-Author: Dott. ssa Morandini, Francesca - Municipality of Brescia; Fondazione BresciaMusei (Presenting author)
Keywords: Archaeology, Enhancement, Technologies
Presentation Preference: Oral

In Brescia, a very long tradition of enhancement and presentation to the public of the ancient properties is still very well recognizable. Since 1480 until 2015, especially the archaeological heritage has been put on display with the aim to educate people and to make them closer to the ancient history of the city. Thanks to a selection of the main projects along the centuries is possible to follow this special sensibility of Brescia, from the exhibition of Latin inscriptions in Piazza Loggia (1480), through the first Museum (1830), the City Museum (1998) and the opening of the archaeological area with contemporary tools and technologies (2013 e 2015).
Aim of our paper is to present especially this latter stage and this place, where the history of Brescia museums begun. Archaeological excavations in the Capitoline area brought to light an uninterrupted sequence of religious buildings dated from IV Century BC to the I Century AD, and provide very important historical information like in no other place in northern Italy.
The ancient landscape has been completely studied and re-enacted, and it is put on display with excellent architectural solutions in order to protect the ancient layers and to enhance their value.
Different tools have been experimented to present the area and the ancient landscape to the public: scientific publications, with phasing drawings; 3D reconstructions of the natural scenery and of the buildings, matching pictures and sketches. Different technological solutions were surveyed in order to select the best targeted tools for the visitors: a video operating like a time machine across the ages, special glasses with augmented reality overlapped to the natural landscape and virtual reality devices to present the ancient landscape of Brixia even far from Brescia.

11 THEMATIC MUSEUMS, AN OPPORTUNITY: THE CASE OF MONTEGROTTO TERME

Author: Prof Zanovello, Paola - University of Padova (Presenting author)
Co-Author: Post Doc Fellow Bassani, Maddalena - University of Padova Italy; Prof Ghedini, Francesca - University of Padova
Keywords: museum, Montegrotto, springs
Presentation Preference: Oral

In the recent years, the discussion about archaeological museums has been intensified, focusing not only on costs, which are always very high, but also on the choices available to make them more attractive and competitive. As a matter of fact, big museums lack a central focus, so people are not very interested in visiting them; more attractive are small museums, which present the history of their local area: here not only tourists but also the local population can see the objects which have been found during archaeological excavations. Among these museums a peculiar type is the specialized museum, which illustrates a single aspect of the past, offering visitors historical, technical and social information.
This is the choice we have made for the museum of Montegrotto Terme (North of Italy, near Padua), which is devoted to the history of Roman thermalism. The land around Montegrotto is characterized by the presence of thermal water which has been well known from the pre-Roman times; recent excavations have identified a Roman villa which adds to the other important remains (pools, halls, a small theatre). It was natural for us to decide to create a specialized museum for local objects enabling to illustrate the different ways in which thermal water was used: from worship to healing to simple welfare.
Finally, the importance of this venue is clarified by its insertion in a European Project called CrossCult, that will develop new technogies for enjoying the archaeological remains and the objects preserved in the museum.

12 UNIVERSITY MUSEUMS OF ARCHAEOLOGY IN EUROPE UNDER THE LOOKING GLASS: CONTEXTS-PROCESSES-PRACTICES-PRACTITIONERS

Author: Dr Mouliou, Marlen - National and Kapodistrian University of Athens; UNIVERSEUM (European Academic Heritage Network) (Presenting author)
Keywords: Participatory University Museum
Presentation Preference: Oral

Among the multiple values museums hold, the educational and collection values are those that usually come first to mind when referring to university museums. Research, care and scientific interpretations of academic collections are sine qua non functions for university museums. However, university museums as all museum institutions are as much about knowledge as about creating valuable experiences to diverse audiences by rendering their collections more relevant to them. This is common knowledge but there are also many questions and uncertainties. This paper will reflect on the current challenges of museum archaeology in Europe through a special focus on university collections, university museums of archaeology and their public programmes. Some pertinent questions arise that can be comparatively explored based on data from different academic cultures and museum practices around Europe:

1. Do university museums of archaeology give emphasis on constructing strong connecting bridges between academia and citizens and to what extent?
2. How difficult is it for university museums to endorse participatory cultures of operation and accept different roles as mediators, with students taking the role of co-creators?
3. And when they adopt this model, do they do it as a way to expand their public programme which otherwise could not take off due to shortage of resources, or instead as a way to express their belief in the value of participatory work as a sustainable investment for the future?
4. Can university collections of archaeology be used as cultural teasers and bring forward key social issues that are relevant for European citizens today beyond the valuable object-based or science-based knowledge they produce?
5. What can be the connection between museum and field archaeology in the context of academic work?

13 NEW STORIES ABOUT PAST PEOPLE AT THE MUSEUM OF ARCHAEOLOGICAL SCIENCES AND ART (MSA).SOME CASE STUDIES

Author: Dr. Menegazzi, Alessandra - Museum of Archaeological Sciences and Art,University of Padua (Presenting author)
Keywords: museumcollections, research, communication
Presentation Preference: Oral

The Musem of Archaeological Sciences and Art (MSA) belongs to the University of Padua museums (Italy) and holds many ancient collections, that are of primary importance for the history of archaeology in this university. The collections research is often connected with teaching programmes and training laboratories.
After its re-opening in 2008, the MSA developed new strategies about collections research in order to communicate the results to a broader public.
The goal was to make the research stories available to the people at different levels of complexity from scholars to pupils of primary school and general public.
But how these stories could be presented to today's people?
The paper proposes a methodology and presents the working steps exemplified on three different researches:
-sculpture and plaster cast collections, as seen through 3D laser scanning survey. How did the ancient masters work? Who copied/restored the sculptures and why? Did the ancient museum exhibitions respect the integrity of the items?
Research group: prof.G.Salemi, dr.A.Menegazzi, dr.E.Faresin

-fakes in the pottery collections: who built the fakes and why? Is there an anthropology of fakes? And what fakes tell us about past people who made and/or collected them?
Research group: prof.M.Salvadori, drr.M.Baggio, E.Bernard, L.Zamparo (see also their presentation in another session of the Conference)

-virtual presentation of a real artifacts: a Pan flute from ancient Egypt. Multidisciplinary approaches to make the flute "sounds" again.
Research group: proff.P.Zanovello, G.De Poli with proff.G.Salemi,G.Molin, I.Angelini, S.Canazza, A.Rodà, F.Avanzini, drr. A.Menegazzi, G.Deotto, C.Bettineschi, E.Faresin, N.Pretto.

14 A MUSEUM NOT MUSEUM: A HISTORICAL PLASTER CAST COLLECTION AT THE UNIVERSITY OF URBINO (ITALY)

Author: Associate Professor Santucci, Anna - University of Urbino (Presenting author)
Keywords: University, historical plaster-casts
Presentation Preference: Oral

At the University of Urbino, in the 18th century Palazzo Albani, is preserved an exiguous but prestigious collection of historical plaster casts mostly derived from classical sculptures. All of them, but five pieces, were acquired around the half of the 19th century by the Fine Arts Institute of the Marche region, which was founded at Urbino in 1861. The casts had didactic purposes and were used as models for drawing exercises until the half of the 20th century, when they were not more used as medium in the artistic training and conseuquently were forgotten in the storage of the Fine Arts Institute. Nevertheless, since the 1970's around forty pieces from the original collection knew a second life after their transferring to the Archaeological Institute of the University, where they startee to be used again for didactic workshops and seminars on classical art, and were also included among the artistic attractions of the city center thanks to their arrangement as a 'museum.' Today such public engagement of the 'museum' continues and many activities are promoted in order to disseminate the knowledge of this cultural heritage. But the 'Museo dei gessi' at the University of Urbino is not a real museum. It never had a formal statute of foundation, the propriety of the casts remains to the Institute of Fine Arts, and the ordinary management, without financial resources, can't satisfy all the necessary services to its everyday life. Consequently, the opposite face of the annual events promoted in and on the 'museum' (conferences, seminars, performances, exhibitions etc.) and the appreciation of them by visitors and spectators is a long list of lacks and failings (e.g. appropriate lightning system, opening and maintenance services, video surveillance system, monitoring of the microclimate etc.).

15 FROM ZERO TO 13.000. VISITORS OF A UNIVERSITY ARCHAEOLOGICAL MUSEUM

Author: Dr. Tarantino, Chiara - Università di Pisa (Presenting author)
Co-Author: Prof. Donati, Fulvia - Università di Pisa
Keywords: Visitor Analysis University
Presentation Preference: Poster

The Plaster Casts Museum of the University of Pisa - Report with charts on the 2016 visitors. Numbers, categories, reflections

020 BEYOND MIGRATION: INTERDISCIPLINARY APPROACHES TO MOBILITY IN EARLY MEDIEVAL EUROPE

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Croix, Sarah (Denmark) - Aarhus University; Museums of South-West Jutland
Co-Author(s): Ten Harkel, Letty (United Kingdom) - Oxford UniversityPanhuysen, Raphaël (Netherlands) - ANTHRO.NL; Universiteit van Amsterdam
Keywords: Mobility, bioarchaeology, early medieval history
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

MERC
Medieval Europe Research Community

Historical narratives about the early Middle Ages have long been focused on migrations, from the "Great Migrations" to the "Viking Diaspora". Today mobility appears as a multi-facetted phenomenon, not just affecting large groups of people with military, political, or colonizing motives, but also as culturally and socially induced phenomena revealing the entanglement of individual paths with broader societal and economic trends. In the past decades, biochemical approaches have greatly contributed to these questions. These methods, especially isotopic studies, are now reaching an age of maturity, and their contribution to the general historical and archaeological discourse needs to be addressed. Which kinds of mobility do they reveal? How can these patterns be integrated with the facts and theories from related disciplines? How can we expand our work-frame from site-based or regional approaches to supra-regional, comparative syntheses? How can we investigate interconnectivity from the human angle? Are there serious limitations with the methods? With this session, we aim at bringing together scholars from various disciplinary backgrounds from different regions of Western Europe in a discussion of the way forward for an integrated approach to the study of mobility in the early Middle Ages. Moving beyond the traditional focus on migration, the session has a dual focus, on the one hand exploring aspects of individual mobility / life-story, urban-rural mobility, and social causes of mobility, and on the other addressing methodological challenges for supra-regional comparison and synthesis.
This session complements "People of the North Sea", which focuses specifically on the North Sea region.

01 GEOARCHAEOLOGICAL ANALYSIS: ENVIRONMENTAL CONDITIONS AS DRIVING FACTORS BEYOND MIGRATION

Author: Kempf, Michael - University Freiburg (Presenting author)
Keywords: geoarchaeology, post-roman-transition, peripheral-society
Presentation Preference: Oral

To determine social reaction and adaptation in a changing political and cultural system at the transition from late-Roman to Early Middle Ages, a continuously utilised agricultural area in eastern France was selected to detect land-use change and possible migration processes in a peripheral post-Roman society. Based on environmental data, GIS-modelled settlement dispersal due to archaeological findings was constructed and analysed. I determine possible social effects, reactions, change and adaptation to alterations in the geomorphological balances around the settings of the Alsatian 'Niedernai' region and furthermore scrutinise significant evidence for migration or even population exchange from analysing the environmental circumstances.
The geoscientific patterns are constructed by pedological, geological and topographical maps showing potential shifts in tillage and settlement structures from the local Roman period over the so-called 'Barbarian Migration' until the Early Middle Ages and the Merovingian period.
The converted maps allow recognising changes in agricultural and demographical distribution in a highly fluctuating and continuously populated region. The unique combination of a climatically and pedologically favoured area reflects a high-ranking pull factor through all times - disregarding political, economic and social trends expected by traditional scientific paradigm.
One can state that it is not easy to verify and locate migration processes of large ethnic groups into what is called 'Alamannia' at the transition from late Roman to Early Medieval period. A shifting of land-use is probably just the result of an economical enhancement and not mandatorily forced by social pressure due to large amounts of immigrating foreigners.

02 NON-MOBILITY VS. MOBILITY. A CASE STUDY FROM SCANDINAVIA'S FIRST URBAN SITE, RIBE, DENMARK

Author: Professor Frei, Karin Margarita - National Museum of Denmark (Presenting author)
Co-Author: Assist. Prof. Croix, Sarah - Aarhus University, Denmark
Keywords: Strontium isotopes, Viking
Presentation Preference: Oral

Strontium isotopic investigations are often applied to archaeological human remains in order to identify if the individuals found at a certain site are of local or non-local origin. When non-locals are identified, the interpretational focus often tends to concentrate on them, and their potential origins are often discussed. However, individuals identified as potential locals can be as important as the non-local ones. This paper presents the preliminary results of an ongoing project where the non-locals are the focal point of discussion. We have applied the strontium isotope tracing technique on individuals recently excavated from a cemetery at Ribe, Denmark, considered Scandinavia's first urban site. The emporium, which dates to ca. 700-850 AD, is therefore an important key-site in order to understand how urbanization developed in Southern Scandinavia. With this example, we hope to discuss and contribute with some new aspects on how to explore and compare mobility (or the lack of it) at the beginning of the Viking Age and the identity of the members of the first urban community.

03 WHERE THE CIDLINA LOSES ITS NAME: RETHINKING THE LOCAL IN EARLY MEDIEVAL CENTRAL EUROPE

Author: Hosek, Lauren - Syracuse University (Presenting author)
Co-Author: Dr. Brenner Coltrain, Joan - University of Utah; Dr. Marik, Jan - Institute of Archaeology of the ASCR, Prague
Keywords: Bioarchaeology, Central Europe
Presentation Preference: Oral

This paper is an interdisciplinary exploration of mobility at an early medieval site in what is now the Czech Republic. As one of numerous large, fortified settlements in 9th-10th century Bohemia, Libice nad Cidlinou served as a concentration point for political, economic, and religious activities. Historical and archaeological sources attest to the proximity of several important trade routes, including an overland road into Poland which crossed the Elbe (via the Cidlina tributary) at Libice (Sláma 2000; Kozáková et al 2014). Skeletal

remains from two cemeteries at the site complex of Libice present an opportunity to examine mobility patterns in relation to status, sex, and mortuary treatment. Weaving together isotope data, skeletal analysis, archaeological evidence including mortuary contexts, and contemporary historical sources, we attempt to understand how people and things were in motion on the early medieval landscape. An analysis of stable oxygen isotopes (δ18O) suggests regionally local origins for the individuals sampled in these two cemetery populations. Where preservation allowed, isotopic data was characterized for both tooth enamel and bone for each individual. This intra-individual perspective allows us to examine mobility within individual lifetimes, reflecting residence in both early and later life. While individuals interred at Libice may not have engaged in inter-regional migrations, archaeological evidence attests to the influx of objects and materials of distant origins and influences. Additionally, atypical mortuary treatment draws attention to other ways in which community inclusion and exclusion may be represented. Drawing on multiple lines of evidence allows us to better characterize these early medieval networks of moving people and things.

04 MOBILITY IN EARLY MEDIEVAL DOMBURG, THE NETHERLANDS: PEOPLE AND OBJECTS

Author: Dr Ten Harkel, Letty - University of Oxford (Presenting author)
Keywords: Isotopes, Mobility, Netherlands
Presentation Preference: Oral

An on-going collaborative project between the Province of Zeeland (NL) and the University of Oxford, entitled 'Investigating the Dead in Early Medieval Domburg', took an interdisciplinary approach to investigate the handful of surviving burials from the early medieval trading site and ringfort of Domburg. The site's location as well as the artefactual material is suggestive of wide-ranging contacts. One of the methodologies applied to the skeletal material - which included a 'special' foundation burial underneath the rampart of the ringfort - was strontium and oxygen stable isotope analysis. The results were in line with a 'local' origin, although - given the similarities in 'local' values between large parts of the North Sea coastal regions - this does not necessarily represent conclusive evidence. Taking the interpretative shortcomings of stable isotope evidence as a starting point, this paper will revisit some basic questions about early medieval mobility. Can an interdisciplinary approach result in a more nuanced understanding of early medieval movement and migration? Was inter-regional migration as important for early medieval identities as we make it out to be? Or was community inclusion and exclusion based on other aspects altogether?

05 TRACING MEDIEVAL MOBILITY AND TRADE AT STOKE QUAY, IPSWICH

Author: Ms Farber, Eleanor - University of Oxford (Presenting author)
Co-Author: Professor Lee-Thorp, Julia - University of Oxford; Professor Hamerow, Helena - University of Oxford; Dr. Loe, Louise - Oxford Archaeology
Keywords: Isotopes, migration, trade
Presentation Preference: Oral

The early medieval period saw a rise in trade networks across northwest Europe and Scandinavia, spurred in large part by the great emporia of the North Sea basin. Archaeological human remains from these centres of economic activity can provide novel insights into the long-distance exchange of people and ideas during the medieval period.
This paper explores the evolution of Ipswich from a primary English emporium to a major medieval port town. Historical evidence suggests that international trade increased at Ipswich until the 10th century, when Viking activity led to decreased international trade and a focus on regional markets, followed by another increase in the 11th-12th centuries. The recently excavated skeletal assemblage from Stoke Quay provides a means to test the effects of economic trends on human mobility at a local level. Excavations at this site revealed 1162 burials that provide a nearly continuous record of burial practice from the late 6th-15th centuries AD, coinciding with population shifts driven by trade, armed invasions, urbanisation, and catastrophic famines and plagues.
To address whether changes in migrant demographics correspond with historical and material evidence for shifts in trading patterns, we present the results of strontium and oxygen isotope analysis of tooth enamel from 50 individuals at Stoke Quay. The sample includes males and females from all burial phases, and isotope results are combined with osteological information to provide an understanding of the human experience at this site. We aim to establish the degree of connectivity between English coastal sites, the English interior, and the Continent, with important implications for the spread of ideas, people, and diseases across medieval Europe.

06 THE DIFFERENCE BETWEEN MAASTRICHT AND DORESTAD COMPARING DEMOGRAPHY AND MOBILITY IN OLD AND NEW CENTRES IN THE EARLY MEDIEVAL PERIOD

Author: Dr. Panhuysen, Raphaël - ACASA, Amsterdam University, The Netherlands; ANTHRO.NL (Presenting author)
Keywords: Strontium Demography Emporia
Presentation Preference: Oral

Dorestad was an emporium that is considered to be an important node in the early medieval exchange network. The place itself is described as a new phenomenon that flourished in the Carolingian period. Until recently most of the research on Dorestad focused on the development of the settlement, the harbour site and material finds excavated at this site. A recent study of the cemeteries and human remains provides the opportunity to learn more about the composition of the population buried in Dorestad. By comparing the early medieval cemeteries of Dorestad and Maastricht it is possible to learn more about the population of these centres. This comparison is based on studies of the funerary archaeology, the physical anthropology and isotopic indicators for residential mobility of the buried individuals. For Dorestad a more fluctuating, possibly seasonal, population was expected. Because of its focus on trade an over representation of males and non-local individuals was foreseen. For Maastricht a more stable and balanced population was expected. This paper will compare the demographical and strontium isotope data in their archaeological and historical context and discuss the implications of the differences and similarities between the various populations.

07 INTERNAL MOBILITY. LABORERS AND WOMEN ON THE MOVE IN THE THE LOMBARD KINGDOM (569 - 774 AD).

Author: Dr Pazienza, Annamaria - Ca\'Foscari University (Presenting author)
Keywords: Italy, Lombards, internal-mobility
Presentation Preference: Oral

In the panorama of studies in Italy, the topic of migrations in the early Middle Ages has revolved mainly around the settlement in the peninsula of the Lombards who, as narrated by Paul the Deacon, arrived in Italy accompanied by their wives, children and servants in 569 AD.
In the nineteenth century, this epochal event was interpreted in two opposite ways. Some scholars thought that the Lombards acted as an ethnically separate body since their arrival and for the two hundred years of their reign; some others that they merged with the Romans into a new society quite soon.
These two contrasting narratives still today affect the scholarly debate in Italy, where the historical and archaeological research focuses on some recurring questions: How many were the Lombards? Where did they live? Which was the fate of the Roman population? When and how did they integrate?
Scope of this paper is to set aside these old questions and consider instead some still unexplored issues.
As a historian, thanks principally to the archival documentation, I will illustrate various forms of temporary or permanent micro-mobility of single persons or small groups of people belonging to the middle-class, within the Lombard kingdom and towards the Byzantine areas of the peninsula, like the duchies of Venice and Rome, and vice versa.
In particular, in a gender perspective, I will pay attention to the mobility of women who, once married, joined the husband's family, according to the practice known as 'virilocal residence'.

08 ISOTOPIC EVIDENCE FOR HUMAN MOBILITY IN THE CARPATHIAN BASIN DURING THE MIGRATION PERIOD

Author: Dr. Knipper, Corina - Curt-Engelhorn-Zentrum Archäometrie, Mannheim, Germany (Presenting author)
Co-Author: Dr. Vida, Tivadar - Eötvös Loránd University, Institute of Archaeological Sciences, Budapest, Hungary; Mr Koncz, István - Eötvös Loránd University, Institute of Archaeological Sciences, Budapest, Hungary; Dr. Ódor, János Gábor - Wosinsky Mór Múzeum, Szekszárd, Hungary; Ms Pap, Ildikó Katalin - Savaria Museum, Szombathely, Hungary; Dr. Mende, Balázs Gusztáv - Archaeological Institute, Research Centre of the Humanities, Hungarian Academy of Sciences, Budapest, Hungary
Keywords: Hungary, Isotope analysis
Presentation Preference: Oral

The Carpathian Basin is a key area for historical and archaeological research of the European Migration Period. Written sources convey a complex succession of population groups from the 5th to the 7th century AD. Most prominent among them are the Huns, Gepids, Langobards, and Avars, as well as representatives of the former Roman-Pannonian and possibly Byzantine and Slavic populations. The rich archaeological record, especially in cemeteries, discloses spatial differentiation of funerary practices and grave goods, and changes of these features over time. Nevertheless, an unreflected association of historical entities with archaeological groups of material culture and burial customs can be misleading. Ethnic groups may have been dynamic entities, historically acting leaders or military units may have determined exogenous assignments significantly, and other causes than actual resettlements of people could have led to the observed changes of burial customs and grave goods. Aiming on disclosing the role of residential moves of individuals or groups during the Migration Period, a Hungarian-German research project currently uses an interdisciplinary approach that combines archaeological and anthropological investigations with multi-isotope analyses on human skeletal remains. First results from two completely sampled cemeteries revealed widely ranging strontium isotope ratios among adult males and females. They hint on residential moves of large shares of the burial communities and origins from beyond the Carpathian Basin. In contrast, subadult individuals formed much tighter clusters, which argue for settlement continuity for at least several years. The presentation will discuss isotope data from selected cemeteries regarding their implications for individual and group movements, supra-regional interaction, and the role of mobility in everyday life.

023 APPLICATIONS USING HAND-HELD PORTABLE X-RAY FLUORESCENCE SPECTROMETERS

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Tykot, Robert (United States) - University of South Florida
Co-Author(s): Vianello, Andrea (United Kingdom) - none
Keywords: pXRF, composition, trace elements, limitations
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The production and use of hand-held X-ray fluorescence spectrometers has exploded over the last decade in its use on archaeological materials around the world due to its non-destructive nature, portability, and relatively modest cost for such analyses. While initially there were issues concerning its accuracy, due to the need for standards of the same material as the artifacts being tested, there are now numerous publications and research in progress on the use of pXRF on obsidian, ceramics, metals, and other artifacts, as well as soils, paintings and human remains to address a variety of important archaeological research topics. The portability of the instrument has allowed analyses to be conducted within museums and storage facilities, and in many cases where practicality, cost, or current laws prohibit taking destructive samples and/or transporting objects outside of the country. Nevertheless, conducting surface analyses on potentially heterogeneous samples, as well as with less sensitivity and results for fewer elements than other methods (e.g. LA-ICP-MS, INAA, regular XRF), potentially has limitations on the archaeological questions being addressed.

This session invites presentations where (1) a large number of artifacts have been analyzed and the data support (or not) specific research hypotheses; (2) a multi-method analytical approach is used to assess potential limitations of pXRF in that study; (3) efforts are taken to establish calibration that may be shared among users for particular materials; or (4) new archaeological research questions have been addressed by using a pXRF.

01 PREHISTORIC OBSIDIAN EXCHANGE IN CAMPANIA AND MOLISE (SOUTHERN ITALY): NON-DESTRUCTIVE SOURCING ANALYSIS BY PXRF SPECTROMETRY

Author: Professor Tykot, Robert - University of South Florida (Presenting author)
Co-Author: Dr. Vianello, Andrea - independent
Keywords: obsidian, pXRF, exchange
Presentation Preference: Oral

In 2016, a large number of obsidian artifacts from prehistoric archaeological sites in Campania and Molise (southern Italy) were analyzed non-destructively using a portable XRF spectrometer. This is the first major study of obsidian artifacts in this region, following the early study of a few artifacts from the islands of Capri and Ponza (Hallam, Warren, Renfrew 1976). Specifically, a total of 180 artifacts from the sites of Alburui, Ausino, and Olevano (province of Salerno) and of Venafro (province of Isernia) were analyzed. This expands on our recent studies on obsidian from sites in Sicily and Calabria, presented at previous EAA meetings.

Our research aims to identify the specific obsidian sources and subsources utilized, and what this infers about the socioeconomic characteristics of the societies involved, the capabilities and regularity of maritime transport, and whether there were changes over time. For the sites tested, obsidian from the source islands of Lipari, Palmarola, and Sardinia (Monte Arci) has been identified. Despite the relative proximity of these sites to the Pontine island of Palmarola, the vast majority comes from Lipari (Gabellotto Gorge), which had a great northerly distribution as far as Croatia, northern Italy, and southern France. Surprisingly, all three of the major Sardinia subsources (SA, SB2, SC) are also represented, albeit in small quantities. No obsidian from Pantelleria has been found.

More work is needed filling geographic and chronological gaps in the obsidian assemblages tested in Campania and Molise, and especially in incorporating our results with those on lithic production technology and artifact typology, and on wear patterns and residues representing their usage. Furthermore, the documentation of obsidian mobility may reflect parallel and opposite direction movement of other materials such as ceramics, flint and other lithics, domestic animals and their secondary byproducts, as well as ideas, knowledge, and people.

02 SOURCING OBSIDIAN FROM PREHISTORIC SITES IN NW ROMANIA

Author: Dr. Boroneant, Adina - Vasile Pârvan Institute of Archaeology (Presenting author)
Co-Author: Dr. Virag, Cristian - Satu Mare County Museum; Mr. Astaloș, Ciprian - Satu Mare County Museum; Prof. Bonsall, Clive - University of Edinburgh
Keywords: Romania, XRF, obsidian
Presentation Preference: Oral

Use of obsidian is documented in many prehistoric sites in Romania, ranging in age from Upper Palaeolithic to Chalcolithic. Despite previous reported results attributing the obsidian to geological outcrops in both the Carpathian Mountains and the Aegean, our research points to the former as the only source area used during Romanian prehistory. As expected, the sites with the highest proportions of obsidian artefacts cluster in the northwest of Romania – the area closest to the geological sources – with the frequency of obsidian decreasing with distance from the sources. Our non-destructive XRF analyses contribute to a better understanding of obsidian access, distribution and use, as well as providing insights into the social and economic contacts among various regions of Romania in prehistory.

03 A FIRST INSIGHT INTO PREHISTORIC OBSIDIAN CONSUMPTION AT KÜLTƏPƏ I (NAKHCHIVAN, AZERBAIJAN)

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Keywords: Obsidian, Nakhchivan, HHXRF
Presentation Preference: Oral

The present preliminary study aimed at investigating the obsidian consumption at the archaeological site of Kültəpə I, located along the Nakhchivan River (Araxes basin, South Caucasus). The artefacts under investigation come from the Neolithic and Early Bronze Age (Kura-Araxes cultural complex) levels of Kültəpə I excavated by O.A. Abibullaev between 1951 and 1964. Kültəpə I is one of the few settlements in the South Caucasus that allows a diachronical approach over several millennia. Since these artefacts are now stored in the National Museum of History of Azerbaijan in Baku, it was impossible to export them for geochemical analyses. Our analytical strategy was thus adapted accordingly: analyses of the material were carried out in situ with a Hand-Held Portable X-Ray Fluorescence Spectrometer (Bruker Tracer III-SD). The use of this instrument, which allows a non-destructive and rapid analysis of the objects, resulted in the geochemical characterisation of more than 300 obsidian artefacts in just eight work days. The geochemical compositions we obtained were then matched with the potential geological sources, which gave us a first insight into the obsidian consumption patterns at Kültəpə I and their evolution from the Neolithic to the Bronze Age.

04 TESTING AN OLD THEORY: PXRF-ANALYSIS OF MESOLITHIC GREENSTONE ADZES IN ROGALAND, SOUTHERN NORWAY

Author: Dr. J. Nyland, Astrid - Museum of Archaeology, University of Stavanger (Presenting author)
Co-Author: Dr. F. Gebremariam, Kidane - Museum of Archaeology, University of Stavanger; With, Ruben - Museum of Archaeology, University of Stavanger
Keywords: pXRF, greenstone, Mesolithic
Presentation Preference: Oral

In this paper, we will present results from a new pXRF-analysis of Mesolithic greenstone adzes in Norway. We have analyzed 80 adzes within our study area of Rogaland County on the southwestern coast of Norway. Because of the ongoing debate concerned with the challenges of pXRF-analysis, we will outline our endeavors to ensure good quality data and significant results in view of the pros and cons of the method. The initial aim of our study was to test an old theory launched in 1984 suggesting two social territories at the

western coast of southern Norway. These territories were defined by the distribution of diabase and greenstone adzes from two known quarries, an interpretation that has influenced Norwegian Stone Age research ever since. However, while geochemical analysis was included in the study, the dominating method of identifying rock types was through visual examinations. For example in the county of Rogaland, only 9 out of 268 adzes were geochemically analyzed. Furthermore, in 2006, a test of the applied visual criteria for identifying greenstone using isotope analysis demonstrated the method's vulnerability. Hence, the distribution, and thus, the foundation for the interpretation of the southernmost social territory could be revisited with emerging data from new investigations. With this as our point of departure, we have undertaken pXRF-analysis' of adzes previously visually identified as greenstone from a known source in order to see if they originated from one and the same, or several, geographically dispersed, greenstone sources. What we found indicates that there is more to rock procurement beyond the rocks' physical appearances.

05 XRF SOURCING LITHICS: SOFTWARE BEYOND THE INSTRUMENT

Author: Dr. Scott Cummings, Linda - PaleoResearch Institute (Presenting author)
Co-Author: Mr. Coughlin, Matthew - PaleoResearch Institute; Mr. Varney, R.A. - PaleoResearch Institute
Keywords: element ratios, sourcing
Presentation Preference: Oral

Continual technical development in hand-held XRF technology has produced the Bruker Tracer 5i, which provides enhanced light element sensitivity. However, not all elements are used in lithic sourcing, which works well with both the Tracer 3 and 5i and other instruments. Detection records elements present in known source rocks, after which ratios between individual elements are created using proprietary sourcing software. XRF spectrometers record the number of net counts over the entire time the instrument is used for each reading (live seconds). Net counts, which are are visible in Artax® files, may be divided by the number of live seconds to obtain the counts per second (cps). Ratios between several pairs of elements, which are determined to be critical for identification of obsidian, chert, or basalt (or other) sources, are used in the sourcing software to identify sources. When examining archaeological artifacts elemental readings are collected, then ratios are created. An Excel® spreadsheet is used to track data from individual samples by ratio ranges for each pair of ratios being tracked. When the elemental ratios from each artifact fall within identified ratio ranges they populate the appropriate cells in the Excel® spreadsheet. Use of sourcing software allows objective assignment of samples to a specific source using multiple elemental ratios whose ranges define each source.

Comparison of data produced with the Tracer 3 and 5i spectrometers with other studies using neutron activation analysis (NAA), microwave digestion inductively coupled plasma mass spectrometry (MD-ICP-MS) laser ablation inductively coupled plasma mass spectometery (LA-ICP-MS) is reviewed using proprietary software to assess assignment of each sample to a source. This aspect of the study addresses expectations for correct assignment of sample to source.

06 LET`S SHOOT IT! HOW HAND-HELD PXRF SPECTROMETRY ON CERAMICS CHANGED THE UNDERSTANDING OF THE ROMAN VICUS OF KEMPRATEN (SWITZERLAND).

Author: MA Melko, Nadja - University of Zurich (Presenting author)
Co-Author: Dr. Helfert, Markus - University of Frankfurt; Dipl. phil. Pümpin, Christine - IPNA Basel; BA Lo Russo, Sarah - IPNA Basel; Lic. phil. Koch, Pirmin - Kantonsarchäologie St. Gallen; MA Schärer, Lukas - Kantonsarchäologie St. Gallen; Dipl. phil. Ackermann, Regula - Kantonsarchäologie St. Gallen
Keywords: provenance, workshops, experiment
Presentation Preference: Oral

Since 2012 a research project on ceramics from potteries of the Roman Vicus of Kempraten (Rapperswil-Jona/Switzerland) is taking place, using about 400 samples of pXRF-data (supervision: Markus Helfert, Frankfurt) combined with archaeological and experimental data as well thin section analysis (supervision: Christine Pümpin, Basel). By now, we may present two main approaches providing important results chances and limitations of this corporate collaboration.
1. Clay composition and reference groups
According to an archaeological dataset, reference groups for potteries and fabrics of the Vicus were established, based on the concentrations of certain major- and trace elements (Nadja Melko, Zurich; Lukas Schärer, Bern). To find out details on clay preparation and the source of contamination, experimentally made comparison samples were produced. Five clay sources from Kempraten were tested using different clay mixtures and preparation techniques with polishing and engobes. The experimental material was analysed with thin sections (Sarah Lo Russo, Basel). In this way questions, as the origin of calcium (natural component of the clay source, accumulated from the surrounding soil or added as temper) or the occurrence of phosphor (contamination by modern manuring or added during preparation) could be examined.

2. "Old" data for new investigations
Research with WD-XRF analysis on Helvetic production of Terra Sigillata in Bern-Enge started already in the early 1980ths. Since 2012 three TS moulds found during excavations in Kempraten revived this investigation. Appropriate moulds from other Swiss sites were compared with the data of Bern-Enge. Finally, the cooperation between archaeology (Regula Ackermann, St. Gallen; Pirmin Koch, Cologne) and archaeometry permitted not only the verification of an unknown TS production at Kempraten, but also revealed filiations of the workshop Bern-Enge and extended its known ensemble of TS stamps. It was possible to demonstrate that "old" data can be combined with new data received using well-calibrated pXRF spectrometers.

07 SOURCING THE PROVENANCE OF CORSICAN FINAL BRONZE AGE CERAMICS THROUGH PXRF ANALYSIS OF CLAY BUILDING MATERIAL

Author: Tafani, Aurelien - University of South Florida (Presenting author)
Co-Author: Dr Von Peche-Quilichini, Kewin - INRAP; Prof Tykot, Robert H. - University of South Florida
Keywords: pXRF, ceramics, Corsica
Presentation Preference: Poster

A growing number of ceramics provenance studies rely on the use of a portable X-ray fluorescence spectrometers to determine the chemical composition of the artifacts. PXRF analysis is non-destructive and affordable, making it an ideal technique when the characterization of a large number of artifacts is required. However, the potential of provenance studies of ceramics is still hampered by the difficulty of localizing the clay sources used for the production of ancient pottery, as such an endeavor may be terribly time consuming. In addition, there is a strong possibility that the particular clay source used in the past has been exhausted since then. This study seeks to evaluate the use of clay building material as an alternative indicator of local origin. In effect, it is highly likely that the clay employed for the erection of houses and collective buildings was extracted from local sources. Moreover, this type of clay could easily be modified or used as such to make coarseware pottery. As a consequence, the composition of ancient building clay material may constitute an appropriate proxy for the composition of the clay sources used in local pottery production. In this study, a pXRF spectrometer was used to establish the chemical composition of fragments of daub and adobe collected on 13 Bronze Age sites in southern Corsica. The results were subsequently compared with previous pXRF

analyses of Corsican Bronze Age ceramics in order to assess whether the chemical composition of clay building material could be used as a substitute for clay sources in ceramic provenance studies.

08 XRF ANALYSES ON FRAGMENTS OF LARGE ROMAN BRONZE STATUES FROM ROMANIAN MUSEUMS

Author: Researcher 1st class Constantinescu, Bogdan - National Institute for Nuclear Physics and Engineering Bucharest Romania (Presenting author)
Keywords: bronze, Roman statues
Presentation Preference: Oral

Fragmented bronze sculpture is a category of numerous finds from Roman settlements of Dacia. We concentrated on 60 fragments found in Racari – castrum and civil settlement from South-West of Romania, situated approx 100 km north to Danube and to border between Moesia Superior and Moesia Inferior. XRF measurements were performed using a X-MET-TX3000 portable spectrometer – Oxford Instruments; the exciting X-ray beam is generated by a 40 kV – Rh anode tube. The detection system is a PIN silicon diode detector with Peltier cooling. The resolution of the detector is 270 eV for the Kα line of Mn (5.89 keV). The measurement spot size is about 30 mm2. The spectrometer has a Hewlett-Packard (HP) iPAQ personal data assistant (PDA) for software management and data storage. We determined the alloy composition, especially the proportion of lead and tin, which is from 6% to 48% for lead and from 2% to 11% for tin. The observed technique of gilding was leaf procedure (approx 5 microns thickness), gold being very pure (most probably from contemporary gold coins – aurei). We also found remnants of lead on the inner part of some fragments, suggesting lead was used as a solder. The destruction of the bronze statues (e.g. by Christians) and their use as scrap metal is also important. The possibility of a local workshop with itinerant masters specialized in statues foundry is discussed. Our results are compared with the results of German specialists Frank Willer, Roland Schwab and Kati Bott on fragments found on UNESCO world heritage Limes – Germania Superior, Germania Inferior and Raetia.

09 HHPXRF: A RECONNAISSANCE METHOD FOR EVALUATING CORRODED COPPER-ALLOY ARTEFACTS

Author: Mr Roxburgh, Marcus Adrian - Leiden University (Presenting author)
Keywords: HHpXRF Roman Brooches
Presentation Preference: Oral

For certain research questions Handheld X-ray Fluorescence Spectrometry (HHpXRF) is a suitable elemental measurement technique to study the production of copper-alloy artefacts. But - rather than try to imitate the accuracy and precision of laboratory techniques - it is more beneficial to deploy it in a survey role, one that attempts to model chronological and geographical changes within large quantities of artefacts. To achieve this I will discuss to what extent corrosion and the issues surrounding surface measurements affect the potential of this type of research. A case study of an analyses of Roman period brooches gathered in the Nijmegen region of the Netherlands will be presented.

10 SILVER: THE DRIVING FORCE OF THE DUTCH GOLDEN AGE. PROVENANCE, COIN PRODUCTION AND PATHWAYS OF COINS FROM COLLECTIONS AND SHIPWRECKS.

Author: Dr Os, Bertil - Rijksdienst voor het cultureel erfgoed (Presenting author)
Co-Author: Drs Pelsdonk, Jan - Teylers Museum; Dr Gentelli, Liesel - University of Western Australia; Dr Green, Jeremy - Western Australian Museum; Ms Richards, Vicky - Western Australian Museum; Dr Paterson, Alistair - University of Western Australia; Dr Woodhead, Jon - Melbourne University; Dr Van Duivenvoorde, Wendy - Flinders University
Keywords: XRF, shipwrecks, golden-age
Presentation Preference: Oral

The discovery of the Americas and its silver led to trade possibilities with China and India for porcelain, silk and spices, that without silver would be impossible. Much silver was converted to currency by Dutch mints. A small part was for domestic use, but most silver was shipped directly by the Dutch east India Company for trade. Some of that silver ended on the Australian coast as some of the ships were wrecked at the Australian West Coast.
We analysed about 5000 silver coins from the collection of Teylers museum with handheld XRF, minted between 1300 and 1800, being all silver coins in mint condition as these coins never circulated. This allowed us to construct time composition plots, permitting us to distinguish changes in silver refining, alloying and metal sources, coupled to historic (economic) events, different mints and coin types. Micro-Metallurgic and LA-ICPMS analyses of Australian Dutch shipwreck coins showed that Dutch, Peruvian (Bolivian) and Mexican silver could easily be distinguished on bases of their trace metal composition and structure. Combination of both datasets will help to select endmember or reference coins for isotopic analyses that could be used for reconstructing metal sources and the chaîne opératoire of coin making and use, that formed the base for global trade in the golden age.

028 MANAGEMENT, PROTECTION AND ACCESS TO THE ARCHAEOLOGICAL HERITAGE

Theme: 2. The Valletta Convention: the next 25 years
Author: Musteata, Sergiu (Moldova) - „Ion Creanga" State Pedagogical University
Co-Author(s): Borş, Corina (Romania) - National Museum of History of Romania
Keywords: heritage management, access, protection practices
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Since its adoption the Valletta Convention played an important role in improving the preservation of archaeological vestiges, yet 25 years after one can notice very different implementations and evolutions in various European countries. As a result, further professional exchange is strongly needed as regard sharing practice experiences and best practices in this respect. An aim of such an approach is developing common European guidelines for setting up adequate management structures, monitoring of implementing cultural policies for the archaeological heritage, regulations for protection and access to the archaeological goods etc. A particular related topic is promoting also the dialogue and cooperation between the archaeology professionals and the various stakeholders. Last but not least, during recent years the subject of archaeological archives is increasingly discussed: how to store, preserve and provide access to information of archaeological goods, both taking into consideration the scientific and the public interest. What standards for storage of archaeological remains, access to the cultural goods and publication of the research results should be considered. In the framework of this session, experts are invited to discuss issues about rules and best practices of management, protection, and access to the archaeological heritage.

01 THE FUTURE OF ARCHAEOLOGICAL ARCHIVE PRACTICE IN EUROPE AND BEYOND

Author: Mr Brown, Duncan - HE - Historic England; EAC Working Group for Archaeological Archives (Presenting author)
Keywords: Archives, Standards, European
Presentation Preference: Oral

The 2014 publication of EAC/ARCHES Guidelines 1, a Standard for archaeological archive practice, had the twin intentions of securing archive material across Europe and democratizing access to archaeological information. With explicit reference to that Standard, this paper will examine the extent to which those aims have been, and can be, realized. At present, the Standard is available in seven European languages and more versions are imminent. This should therefore become a universal tool for creating a unified approach to the management of archaeological projects and the development of archive practice. Three years on, this session provides the opportunity to convey this message to a European audience while also considering the wider implications of the EAC/ARCHES project. Such a discussion must necessarily proceed within the context of pressure on the resources for creating, compiling and curating archaeological archives. In many European states, concern is growing at the quantities and quality of the archaeological resource in store; to the extent that practitioners are recommending a selective approach to finds recovery and museum collection. Ethical positions need to be established here, together with some understanding of the situation beyond Europe and how our current practice may be seen to set a precedent, or at least to be an exemplar. The EAC/ARCHES Standard sets out a practical position in the creation of archaeological archives that should be more widely recognized and followed. It is based in a common philosophical understanding of the fundamental significance of archaeological information in all its forms. This paper will therefore look beyond Europe, to the development by CIDOC of a universal mode of archaeological archive practice and the ultimate intentions of all archaeological activity. It has surely never been more important to continue, together, to explore and preserve our common cultural heritage.

02 PRESERVING SCIENTIFIC DOCUMENTATION OF PREVENTIVE ARCHAEOLOGY: FROM ARCHIVING TO SHARING IN THE FRENCH NATIONAL INSTITUTE FOR PREVENTIVE ARCHAEOLOGICAL RESEARCH (INRAP)

Author: Dr Nurra, Federico - INRAP - National Institute for Preventive Archaeological Research (Presenting author)
Co-Author: Ms Bryas, Emmanuelle - INRAP - National Institute for Preventive Archaeological Research
Keywords: Documentation, Interoperability, Archaeology
Presentation Preference: Oral

Since its creation, the French National Institute for Preventive Archaeological Research (Inrap) has carried out more than 2.000 preventive archaeology operations per year and produces for each archaeological operation, in addition to an operational report, a considerable amount of documents.
In 2006, the Inrap's Scientific and Technical Direction (DST) decided to organise the management of this documentation in order to allow consultation and reuse.
The operation's report has established itself as the entry point of this documentation: it's systematically present and since 2004 its content is set by law.
This corpus of documents deserved to be organized, classified and made it available.
The aim was to realise a tool allowing at least the reporting, referencing and location of those documents.
Several arguments prevailed in the choice of the IT solution: the necessary interoperability and the opportunity to making the document available in digital format.
It has been imposed the choice of an integrated library management system, complying with the international standard UNIMARC.
In order to unify the descriptions and facilitate the linking of documents, it was decided to describe their content using a controlled vocabulary: the "Pactols" thesaurus, created by the CNRS-Frantiq network.
Thanks to this choice of a structured system complies with data exchange standards, 7 years later, Inrap was able to share more than 28.000 archaeological reports on a European archaeological data platform (ARIADNE).
The purpose of this paper is to show how the reasoned management of the operational reports has offered a framework that makes it possible to figure today the availability of all the archaeological documentation and allows a reflection on the data sharing
The work carried out within the framework of the ARIADNE project will serve as example for the implementation of an interoperability approach: mapping of data structures, alignment between different vocabularies and geocoding.

03 NOT JUST OLD PHOTOS AND DUSTY PLANS: CHANGING PERCEPTIONS OF ARCHIVING.

Author: Ms Scardina, Audrey - University of Edinburgh (Presenting author)
Co-Author: Mr Mills, Sam - Independant scholar
Keywords: Post-excavation, Archiving, Outreach
Presentation Preference: Oral

One of the largest issues facing the implementation of successful archiving in Scotland are the pre-existing conceptions within archaeology itself. Archiving of post-excavation material, including paper records, field drawings, photographic records, and artefacts, is often seen as of secondary importance to the excavation itself. This is despite guidelines set out in Scotland's Archaeology Strategy obliging archaeologist to submit post-excavation material in a suitable fashion. This can lead to a backlog of archaeological archival material across several sectors. Equally, there is often a sense that scholars who engage with previously excavated material are not 'real' archaeologists.

These pre-existing ideas need to be changed if archaeological archives are to be completed to a high standard fit for further research. In this paper, we will first discuss the issues that have led to negative perceptions surrounding archiving, then consider different ways of changing these ideas. One way to do this is to include archiving as part of the process for all archaeologists working on training excavations, either with commercial units or in education. We will argue that Archiving should be considered the next step of the excavation, rather than a post-project chore. Another step is to provide access to information about archival work through outreach projects. Finally, we will suggest ways to make the process of archiving more accessible though simpler methods of recording. We hope our suggestions will not only help change pre-existing conceptions about archaeological archiving, but also aid in the process of setting up best-practice through developing mutual respect.

04 THE ARCHAEOLOGICAL HERITAGE IN THE PROCESS OF REVITALIZATION: THE BALANCE OF GAINS AND LOSSES.

Author: Mrs Byszewska, Agata - Narodowy Instytut Dziedzictwa / National Heritage Board Of Poland (Presenting author)
Keywords: management, heritage presentation
Presentation Preference: Oral

For last several years, basing on the financial benefits of EU programs, local governments in Poland undertake projects under the banner of the revitalization of historical urban spaces. Observing this phenomenon one may have the impression that actually revitalization has a extremely broad meaning. In its concept there is repairs, reconstructions, conservation, demolition of old buildings and cleaning the land for the construction of new ones. Such diversity in understanding the concept of revitalization demands to create a clear definition of this process and define its rules and procedures. Although the law regulates the legal, organizational, administrative procedures, however it does not exhaust all aspects of this multi-threaded process. Revitalization is a broad and complex process that combines different areas of life, it takes place in a particular social, cultural, ecological, economical, historical space and in the same time creates it. The revitalization covers a broad time horizon - reviving the past, the present and the future is created. It is essential that all elements of this activity should be coordinated, integrated and conducted in accordance with established criteria and principles which guarantee the sustainable development of revitalized urban space. Archaeological monuments are an important part of the process, unfortunately often they are ignored and treated as an obstacle for the urban development. It is necessary to search for such a ways of management of archaeological heritage that will ensure to maintain its scientific value and will make archaeological and historical landscape understandable for local communities.

05 HERITAGE PROTECTION IN HALLSTATT - A TEXTBOOK-LIKE COMMUNICATION CRISIS IN AUSTRIA

Author: Magistra Loew, Carmen - Kuratorium Pfahlbauten (Presenting author)
Keywords: management, communication, Hallstatt
Presentation Preference: Oral

The village of Hallstatt in the Salzkammergut region of Upper Austria is famous for its rich archaeological heritage. The burial ground from iron age and the prehistoric salt production have been providing new impulses for research over more than 160 years. Since 1997, the town of Hallstatt, together with three other municipalities, and the landscape around the mountain Dachstein has been one of the world's few UNESCO World Cultural Heritage sites, which are also World Natural Heritage sites.
An attempt by the Heritage Protection Office in 2010, to put a part of the village called "Markt" under ensemble protection, initiated one of the biggest communication crises in the history of the Austrian heritage protection. The information about the plans had reached the inhabitants and community workers only on detours. This led to massive public protests, which have spread widely in media. The course of the crisis can be described as textbook-like. The massive protest of the inhabitants of Hallstatt is even more remarkable, as it has been the local population, which prevented the construction of a lakefront road in the 1960s. This would have destroyed large parts of the village, but was approved by the heritage protection office back then.
The conflict still lingers today and is a detriment to the monuments of Hallstatt, because a large part of the population still takes a negative attitude towards the conservation measures in the village. This rejection can lead to the fact that requirements of the heritage protection office are not fulfilled.
The lecture uses the example of Hallstatt to trace the classic course of communication crises, thus demonstrating the importance of communication in management in archeology and heritage protection. Possible counter-measures in the individual phases of the conflict are shown.

06 FROM THEORY TO PRACTICE: PROTECTING AN ARCHAEOLOGICAL SITE. THE CASE OF THE TARTARIA – PODU TARTARIEI VEST SITE (ROMANIA)

Author: PhD BORS, Corina - National History Museum of Romania (MNIR) (Presenting author)
Keywords: archaeological heritage management
Presentation Preference: Oral

About 20 years ago a new reality emerged in Romania: the large-scale preventive archaeological excavations occasioned by the construction of the motorways along the Pan-European transport corridors. However, given this new dimension for the contractual archaeology in Romania no further official attempts were made for developing better tools and strategies for outlining and mapping adequately the archaeological sites. As a result, the archaeologists had, very limited time to undertake preliminary surveys prior to the commence of the construction works for identifying the areas of archaeological interest where preventive excavations had to be undertaken.
The prehistoric (middle Hallstatt period) site of Tartaria – Podu Tartariei vest (Alba county, Romania), excavated in 2012, by its archaeological features and finds, is relevant for a case study, if to discuss a series challenges encountered nowadays as regards the efficiency and quality of large scale archaeological preventive excavations in Romania, as well as issues regarding its protection, since it was only partially (about 15% of it) impacted by the construction of a motorway. A series of topics are to be considered, respectively the ones regarding the legal framework and constrains for such archaeological works, the data management strategy and the development of associated GIS project, public archaeology aspects, post-excavation study and conservation of archaeological data and materials and publishing the data for research. Also, following the preventive archaeological excavations undertaken in 2012, since it was obvious that the site was by far larger, a second archaeological project related to its protection and scheduled excavation commenced, namely for the part (about 15 hectares) which was not impacted by the motorway's construction but by agricultural works. The paper will present the aims, challenges and results of this archaeological project for the site Tartaria – Podu Tartariei vest during the last 5 years.

07 PROTECTION OF ARCHAEOLOGICAL HERITAGE AFTER 25 YEARS OF VALLETTA CONVENTION. CASE OF ROMANIA AND REPUBLIC OF MOLDOVA

Author: Professor Musteata, Sergiu - „Ion Creanga" State Pedagogical University (Presenting author)
Keywords: archaeological heritage protection
Presentation Preference: Oral

Since 1992 European Convention on the Protection of the Archaeological Heritage (revised) is playing an important role for most of the European countries in the process of improving management and preservation tools. Romania and the Republic of Moldova are among the 42 accessions countries of the Valletta Convention. Romania signed the this Convention in 1996, ratified in 1997 and has been enforcing it since the 21st of May 1998, but the first official document on archaeology according to the Valletta Convention was approved by Romanian authorities only in 2000, and then modified in 2001, 2003, 2006. The Republic of Moldova signed the Valletta Convention in 1998, ratified in 2001 and enforced it only in November 2002, while the law on archaeological preservation was voted by the Parliament only in September 2010. We can see how different was the process

of signing, ratifying and enforcing this European Convention in the two neighbor countries. Nonetheless, in both cases it is important to see the impact of the international and European conventions on archaeological research and preservation, and how these treaties influenced the legal and management changes in these countries.
The paper will discuss, in comparative perspectives, the impact of Valletta Convention in both countries. By this presentation, I will try to answer to following questions: how the Convention influenced the legal and management changes; which responsible institutions were created; how the dialogue between the archaeology professionals and the various stakeholders helped to improve the protection system; etc.
A special attention will be paid to the subject of archaeological archives and how in both countries it is organized storage and preservation of the archaeological goods and remains. What standards and rules are approved in Romania and Moldova for better access to the archaeological information and publication of the research results.

034 NEW APPROACHES TO HUMAN MOBILITY IN 4TH AND 3RD MILLENNIUM BC IBERIA

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: De Valera, Antonio (Portugal) - ERA Arqueologia S.A.
Co-Author(s): Frieman, Catherine (Australia) - ANUWood, Rachel (Australia) - ANUWright, Lizzie (United Kingdom) - Sheffield University
Keywords: Iberia, Isotopes, aDNA, mobility
Presentation Preference: Session with pre-circulated papers

Iberia, by dint of its geographical position between Europe and Africa as well as between the Mediterranean and the Atlantic, has been a major crossroads throughout its history and prehistory. People moving between continents and over oceans have stopped here and left their mark for millennia. This interchange may assume many forms (from gift to regulated economic trade), it can be highly ritualized or almost totally desacralized, and address almost everything (persons, animals, objects, raw materials, ideas, beliefs, knowledge, etc.).

This session seeks to bring together the numerous projects currently underway around Iberia which are using scientific tools, such as isotopic research and ancient DNA analysis, to look at the mobility of people, populations and their animals in Neolithic and Chalcolithic/early Bronze Age (4th-3rd millennia BC) Iberia. We welcome papers examining mobility at all spatial and temporal scales from single sites or individuals to regional patterns, larger population trends and diachronic change in mobility, as well as efforts to construct isoscapes to better understand the isotopic data. The ultimate aims are: 1. To enhance dialogue between these various projects; 2. To help construct a bigger and more nuanced picture of mobility across Iberia during this very significant period in prehistory; and 3. To explore how new data from human and animal remains is adding to or altering the narratives we've previously developed from sites and material culture.

01 MOVING BODIES OVER SPACE AND TIME: MULTISCALAR ANALYSES AND CRITICAL REFLECTIONS

Author: Dr Lillios, Katina - University of Iowa (Presenting author)
Keywords: Iberia, mobility
Presentation Preference: Oral

Analytical methods designed to trace human mobility offer archaeologists the possibility of generating new insights into the social dynamics of ancient lives. But how can we translate biochemical signatures of locality or non-locality into socially meaningful behaviors? This paper employs a multiscalar perspective to address mobility and social history between the 4th-2nd millennia BCE of the Iberian Peninsula. It draws from three projects and three scales of analysis: 1) excavations at the mortuary cave of Bolores (Torres Vedras, Portugal), 2) bioarchaeological investigations of populations in the Sizandro Valley of Portugal, and 3) demographic studies of the Iberian Peninsula. It critically explores the implications of mobility (and non-mobility) in terms of social identity and agency, and advocates for a biographical and contextual approach to human lifeways.

02 THE ROLE OF AGGREGATION CENTERS IN NEOLITHIC SOUTHWEST IBERIA: ISOTOPIC APPROACHES TO PERDIGÕES ENCLOSURE.

Author: Dr Valera, Antonio - Era Arqueologia; ICArEHB - Algarve niversity (Presenting author)
Co-Author: Dr Zalaite, Indre - Hércules Lab. - Évora University; Dr Maurer, Anne-France - Hércules Lab. - Évora University; Dr Dias, Cristina - Hércules Lab. - Évora University
Keywords: Mobility, Isotopes, Perdigões
Presentation Preference: Oral

Only recently the approach to mobility and interaction in Portuguese Recent Prehistory started to be address through empirical data directly related to people and animals, namely by isotopic analysis of human and animal remains. This research in human and animal mobility based in direct data is still in a preliminary stage in Portugal and it has been developed with materials from sites of different chronology and with disparities regarding the quality of the archaeological record and still with a reduced number of samples per site. Furthermore, the mobility of objects / raw materials, animals and humans tended to be addressed separately (different and independent research projects) and not in an integrated way, as parts of a same social, economic and ideological system. The function and intensity of mobility and interaction are still blur and essentially sustained in theoretical assumptions, namely regarding human and animal movements.
To address this problem a project was designed to understand the social role of mobility and interaction in the organization of Late Neolithic and Chalcolithic societies in South Portugal and the importance of large ditched enclosures in establishing large networks of relations and function as aggregation centers, taking the Perdigões site as case study. In this paper we intend to present the results already available and debate some of the problems of such approaches.

03 A BIGGER PICTURE OF PREHISTORIC MOBILITY: THE ANU SR MAPPING PROJECT IN IBERIA

Author: Dr. Frieman, Catherine - Australian National University (Presenting author)
Co-Author: Prof. Dr. Grun, Rainer - University of Griffith; Dr. Wood, Rachel - Australian National University; Dr. Valera, Antonio - ERA Arqueologia S.A; Dr. Willmes, Malte - UC Davis; Prof Spriggs, Matthew - Australian National University
Keywords: Mobility, Strontium, basemap
Presentation Preference: Oral

Over the last two decades, isotopic analyses of human remains have become a major focus of archaeological research and have opened new vistas for our understanding of small- and large-scale mobility in the past. However, correlating isotopic data with more traditional archaeological materials and interpretative paradigms has not always been an

easy process, and we still rely heavily on early 20th century models of migration and diffusion for our understandings of how mobility and social/technological change relate. In this paper, we will discuss the background and initial results of an ongoing collaboration between geochemists and archaeologists to develop better scientific and interpretative tools to discuss human mobility. Over the last decade, this team has developed new methods to produce regional basemaps of bioavailabe Sr for use in geological and archaeological modelling. However, the low resolution maps produced elsewhere in Europe have proven difficult to correlate with archaeological data. Thus, in expanding the Sr basemap to Iberia, we are attempting to build archaeological questions into the mapping process so that the data produced will be of greater value to the wider research community. We will discuss this process with regard to our case study period of the mid to late 3rd millennium BC and the site of Perdigões, Alentejo. We highlight in particular the need for mobility research to be fully interdisciplinary, collaborative and adaptable.

04 NEW INSIGHTS INTO ANIMAL MOBILITY IN CHALCOLITHIC PORTUGAL: RESULTS OF STRONTIUM ISOTOPE ANALYSIS ON CATTLE FROM THE ZAMBUJAL AND LECEIA

Author: Dr Wright, Lizzie - University of Sheffield, UK; Northern Archaeological Associates, UK (Presenting author)
Co-Author: Dr Waterman, Anna J. - Mount Mercy University, US; Dr Kunst, Michael - German Archaeological Institute, Madrid, Spain; Prof Cardoso, João Luís - Centre for Archaeological Studies, Oeiras Municipal Council, Portugal; Prof Tykot, Robert H. - University of South Florida, US; Dr Peate, David W. - University of Iowa, US
Keywords: cattle-mobility, Chalcolithic, Portugal
Presentation Preference: Oral

The Portuguese Chalcolithic (c3500-2000 BC) was a time of significant social and economic change. These changes included the expansion of complex settlements and short and long distance exchange networks. Domesticated animals played an important role in these transforming economies, and it is likely that they migrated with, and were traded by, humans in these new networks. Strontium isotope analysis can provide a window into prehistoric animal mobility as analyses of strontium isotopic ratios (87Sr/86Sr) can be used to identify non local animals by comparing animal dental enamel with local environmental 87Sr/86Sr ratio ranges. This paper outlines the results of new strontium isotopic analyses from cattle recovered from the Chalcolithic fortified settlement sites of Zambujal and Leceia (Estremadura). Results of this study indicate that the cattle population at Leceia included more non-local animals than at Zambujal, possibly indicating variations in settlement economies across relatively short distances. These results have important implications for our understanding of animal management at Portuguese Chalcolithic sites, and the involvement of animals in the emerging economies of the time.

05 A NEOLITHIC 'SILK ROAD': TRACKING PREHISTORIC TRADE AND MOBILITY IN IBERIA FROM THE CULTURAL USE OF CINNABAR (HGS)

Author: Dr Valera, António - Era Arqueologia; ICArEHB - University of Algarve (Presenting author)
Co-Author: Dr Emslie, Steve - University of North Carolina; Dr Higueras, Pablo - Universidad de Castilla-La Mancha
Keywords: Neolithic, Cinnabar, Mercury
Presentation Preference: Oral

Cinnabar is a naturally occurring mineral that is found worldwide and is used as a source for mercury in mining and metallurgy. Prehistorically, it was also important as a red pigment for use as body paint, but could also serve as a medicinal and even a preservative when sprinkled over bodies in graves and tombs. Although cinnabar is available globally, geologic deposits where it can be mined are highly localized and thus have become important sources for this mineral. The largest deposit of cinnabar in the world is at Almadén, Spain, where it has been mined since at least the late Neolithic through the 20th century. Because cinnabar had so many uses prehistorically, and was in high demand, it is likely that extensive trade routes once connected Almadén with major sites throughout Iberia. Mercury also has seven stable isotopes that vary in relative composition in cinnabar from different geologic deposits where it formed. Thus, isotopic composition of cinnabar recovered from archaeological sites can be used to identify the source or mine where it originated, providing valuable information on trade and mobility of prehistoric peoples. Further, the inorganic mercury in cinnabar retains its isotopic signature even when extracted from the mineral so that any mercury in biological tissues that accumulated as a result of using cinnabar in life can be traced to its geologic source as well. Here, we provide guidelines for how cinnabar can be studied to track trade and mobility in prehistoric Iberia. We hypothesize that the high importance of this mineral in prehistoric Iberia led to the development of extensive trade routes, a Neolithic 'silk road' that likely linked Almadén to many other parts of Iberia and beyond.

06 HUMAN AND ANIMAL MOBILITY IN FOURTH MILLENNIUM BC PORTUGUESE ESTREMADURA. CURRENT DATA AND INTERPRETATIONS.

Author: Professor Carvalho, António - University of Algarve (Presenting author)
Co-Author: Professor Valente, Maria João - University of Algarve; Dr Díaz-Zorita, Marta - University of Tübingen; Dr Gonçalves, David - University of Coimbra
Keywords: Neolithic, mobility, pastoralism,
Presentation Preference: Oral

Isotope studies carried out at the Middle Neolithic cave cemetery of Bom Santo, located in the karstic system of the Montejunto mountain, indicated an unexpected twofold pattern: 1) some humans and sheep/goats are non-local; and 2) the former had their subsistence based on terrestrial food sources but with brackish / freshwater inputs in diets. This pattern was explained as the result of Postglacial environmental conditions at the lower Tagus basin. Its wide estuary at the time may have allowed both the exploitation of aquatic resources and movements of people with their flocks (itinerant pastoralism) between both river banks, thus also comprising the geologically older granitic plains of the Alentejo hinterland. One of the open questions was to evaluate if this reflected a behaviour common to the rest of the Estremadura or if it was determined by specific ecological conditions. To shed light on this issue, humans and animals from two coeval burial-caves, Barrão and Casais da Mureta, were sampled. These are located in similar limestone environments, the Aire and Candeeiros mountain range, but north of the Tagus palaeoestuary. Preliminary results show a contrasting scenario upriver, where a full terrestrial-based diet is almost exclusive and humans and sheep/goats seem to be mostly, if not all, local. Overall, this is testimony of adaptable subsistence and mobility strategies, however under a strong emphasis on terrestrial (farming) food sources, not under any hypothetical process of return to typically forager lifeways.

046 THE MATERIALITY OF ROCK ART: INSIGHTS INTO RELATIONSHIPS BETWEEN PEOPLE, PLACE AND OBJECT IN WORLD ROCK ART

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Goldhahn, Joakim (Sweden) - Linnæus University
Co-Author(s): May, Sally Kate (Australia) - Griffith University
Keywords: Rock art, Material Culture Studies
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

This session explores depictions of material culture in rock art assemblages from around the world and, furthermore, questions the multidimensional relationships between people, place and object that rock art signals. Though far from present in all rock art areas, depictions of material culture do occur in many of the regions famed for their rock art traditions including, but not limited to, Spain, France, South Africa, Australia, Norway, Sweden, and Mexico. While the subject matter and age of these rich assemblages varies dramatically all provide a unique glimpse into the production, function and context of material culture of the past. For this session we welcome papers that innovatively explore the relationship between rock art and material culture and, in particular, papers that present new research and those that link rock art with broader theoretical movements in material culture studies.

01 ARTEFACTS IN ART: GLOBAL APPROACHES TO PEOPLE, PLACE AND OBJECT IN WORLD ROCK ART

Author: Dr K. May, Sally - Griffith University (Presenting author)
Co-Author: Professor Goldhahn, Joakim - Linnaeus University
Keywords: Rock-art, material culture
Presentation Preference: Oral

This paper serves as an introduction to the session and explores the ways in which archaeologists have engaged with material culture depicted in rock art. As early as the 1780s, Anders Forssenius and Sven Lagerbring were using depictions of wagons on Roman coins to better understand the chronology and origins of Scandinavian rock art. This began a long tradition of comparative analysis between actual objects and their rock art lookalikes across the globe – something that continues today. Yet, there have also been significant shifts in the way people understand the multidimensional relationships between people, place and object that rock art signals. This includes theoretical shifts in our understanding of gender, ritual and identity. This introduction will use key case studies from all around the world to illustrate this history and current trends in studies of material culture in rock art.

02 BEYOND INDIVIDUAL PLEASURE AND RITUALITY: SOCIAL ASPECTS OF THE MUSICAL BOW IN SOUTHERN AFRICA'S ROCK ART.

Author: Dr Lenssen-Erz, Tilman - University of Cologne
Co-Author: Vogels, Oliver - University of Cologne (Presenting author)
Keywords: brandberg, musicarchaeology, ethnohistory
Presentation Preference: Oral

Bows in hunter-gatherer societies are not mono-functional items. Besides hunting and fighting, they may also have been used for musical purposes. Rock art in southern Africa provides a record of this use, giving way to investigating past music cultures. This paper brings together the published depictions of musical bows from across southern Africa with some new discoveries. Although depictions of bows being played as musical instruments have been recorded for decades, these scenes still lack archaeological or musicological investigation. When analyzing these depictions, it turns out that there is a comparatively wide variety of technical aspects of sound production, of ways of playing and of contexts of the musical performance, indicating rich cultural diversity among the early hunter-gatherer peoples of the subcontinent. Moreover, the paintings show details in these aspects that are not corroborated by ethnographic studies. Nevertheless, they open up a tableau of the potential context variability in the musical practice of prehistory and also indicate that rock art studies should be open to finding contexts of meaning beyond the dichotomy of the purely ritual and the profane.

03 PRODUCTION, REPRODUCTION AND THE MAKING OF PEOPLE: THE ROCK ART OF HOUSEHOLDS AND HOMESTEADS IN THE NORTHERN CAPE, SOUTH AFRICA

Author: Associate Profesor Hall, Simon - University of Cape Town (Presenting author)
Keywords: Tswana, household, initiation
Presentation Preference: Oral

One motif theme in the rock engraving of southern African Bantu-speaking farmers is the depiction of household and homestead space. In this paper we focus on engravings that can be linked to ancestral Tswana-speaking cattle and cereal farmers in the Northern Cape that date from the 18th and 19th centuries. Using ethnographic sources we outline the spatial structure of a Tswana household that provided the physical setting for quotidian domestic production and consumption. This spatial structure was also indivisibly the arena of social reproduction, and especially, a 'map' of gendered roles and responsibilities. It is against this background that we discuss the engraved reproduction of household space as performed embodied action in the process of female initiation and their transformation into the responsibilities of adulthood. In support of this we also consider associated engravings of clothing and bodily adornment. In conclusion we make some suggestions about the specific historic context within which this art was made.

04 THE CASE FOR BASKETS: ROCK PAINTINGS OF BAGS AND BASKETS IN WESTERN ARNHEM LAND, AUSTRALIA

Author: Miss Miller, Emily - Griffith University (Presenting author)
Keywords: Rock Art, Baskets
Presentation Preference: Oral

Depictions of baskets in the rock art of Western Arnhem Land provide a unique opportunity to study an artefact type that does not commonly survive in the excavated archaeological record of northern Australia. Ethnographic research has suggested that baskets played a role in many aspects of Aboriginal life in northern Australia – from cultural

beliefs and ceremonies to everyday food gathering activities. This paper presents results from the first detailed study of baskets in Australian rock art. As well as presenting the first typology of baskets in rock art from this region, this study illustrates that multiple basket types were in use over varying periods of time with some clearly pointing to specific uses and association with male or female figures. This rock art evidence is, in many ways, contradictory to the ethnographic evidence recorded following the introduction of Christian Missions to the area. These and other key findings demonstrate the potential for this rock art subject matter to increase our understanding of the role that baskets played in Aboriginal life in the recent and ancient past.

05 ACCUMULATION AND DISPLAY? ROCK ART, CIRCULATING ARTEFACTS AND BODIES IN LATE BRONZE AGE IBERIA

Author: PhD Diaz-Guardamino, Marta - Cardiff University (Presenting author)
Keywords: Late-Bronze-Age, Iberia, Material-culture
Presentation Preference: Oral

This paper will explore the links between rock art imagery, artefacts and human/animal bodily remains in Late Bronze Age Iberia. Iberian Late Bronze Age stelae, also known as 'warrior' or 'southwestern' stelae, are decorated with a wide range of carved motifs composing fairly standardized iconographies that are broadly distributed across western and southern Iberia. The catalogue of elements carved on stelae is very rich: human bodies, headgear, necklaces, brooches, swords, bows, chariots with horses, dogs, mirrors, weight looms, combs and lyres. Some of these are realistic life-size representations while others are rather small and schematic. Because of the categories depicted and their arrangement on the stone canvas, it is generally believed that stelae imagery had a funerary meaning. While their actual link with funerary remains is elusive, their commemorative role as landscape monuments is broadly accepted.

Until now the relationship between this rock art imagery and material 'correlates' has only been discussed in order to establish a chronological framework for the production of these engravings or to determine the cultural affiliation of the artefacts represented and outline the range of long distance relationships (i.e. with other Atlantic and the Mediterranean regions) in which Iberian 'elite' individuals were involved. By looking at the patterning of carved motifs within stelae and the presence/absence of the material 'correlates,' their archaeological contexts and associations, this paper aims to look at the interplay between rock art, hoards, single finds, and burial assemblages in Late Bronze Age Iberia and discern the role of rock art imagery in Late Bronze Age mortuary practices.

06 EQUIPMENT OF ASIAN ARCTIC WHALE HUNTERS IN ROCK ART AND ITS ARCHAEOLOGICAL CONTEXT

Author: Prof.Dr. Devlet, Ekaterina - Institute of Archaeology, Russian Academy of Sciences (Presenting author)
Co-Author: Ph.D. Dneprovski, Kirill - The State Museum of Oriental Art, Moscow, Russia; Sukhorukova, Elena - The State Museum of Oriental Art, Moscow, Russia; Greshnikov, Eduard - National Research Centre "Kurchatov Institute", Moscow, Russia; Grinko, Alexandra - Institute of Archaeology, Russian Academy of Sciences; Pakhunov, Alexander - Institute of Archaeology, Russian Academy of Sciences
Keywords: rock art, Chukotka
Presentation Preference: Oral

Oriental Museum in Moscow has numerous carved bone items from excavations in Russian Arctic (Chukotka Peninsular) that are dated back to the 1st millennium AD. New studies of the materials are supported by RFBR 16-01-00419 grant and focused on the comparison of the ivory carvings and rock art whale hunting scenes from the Kaikuul bluff (Pegtymel). The unique rock art images of hunting from Pegtymel demonstrate that tundra and the sea were the two inseparable themes in petroglyphs. At the site which is located in almost 30-40 km from the sea shore compositions with whale hunting are numerous and the rock art chronology is often based on the particular details of the hunting tools depicted in rock art. The problem of the local rock art chronology and identifying of hunting whale equipment should receive further consideration in the presentation as well as modern analyses of the bone carving technology and ornamentation details.

07 BETWEEN A ROCK AND AN OAK COFFIN – CLOTH AND INTERMEDIALITY IN THE NORTH EUROPEAN BRONZE AGE

Author: Professor Goldhahn, Joakim - Linnæus university (Presenting author)
Keywords: Rock art Materialities
Presentation Preference: Oral

Rock art is a fluid media which enriches our understanding of the function and use of past and present materialities. This paper explores Bronze Age cloth and how it appears across different mediums; from factual finds in oak coffin burials, to the loom weights found within settlements, bronze figurines in ritual deposits and in rock art. Drawing on finds from across northern Europe, I will argue that a biographical perspective could be essential to broadening our understanding of how representations of cloth differ across media. Is the message altered by the medium or is the medium the message?

055 ARCHAEOLOGY AND THE EUROPEAN FAR-RIGHT: ATTITUDES AND RESPONSES FROM HERITAGE BUREAUCRACIES

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author:
Co-Author(s): Niklasson, Elisabeth (United States) - Stanford UniversityHølleland, Herdis (Norway) - Norwegian Institute for Cultural Heritage Research
Keywords: Heritage Politics, Compliance, Far-right, Democratization
Presentation Preference: Session with a key note speaker with contributions from discussants and discussion

Heritage bureaucracies represent a combination of technologies, texts and communities of practice that have been given a mandate to manage the remains of the past and transform political directives into action; whether it is through funding programmes, guidelines for archaeological archives and museums, or by setting priorities for Cultural Resource Management. Thus, they form part of the political fabric that makes up contemporary Europe at local, regional, national and international levels. As this fabric is increasingly torn in conflicting directions, the ideas about what heritage and archaeology should "do" for society changes. Marking the 25th anniversary of Maastricht, the politics of the past are as relevant as ever. In this session, we examine heritage bureaucracies' attitudes and responses to the rise of the European far-right. More specifically, we want to explore

the following: What characterises far-right heritage policy? How do the often slow-moving structures of heritage bureaucracies impact the implementation of far-right policies? How are policies pushed forward or stalled through governing tools such as laws, planning regulations, white papers, budgets and management plans? In what way have the conditions introduced by New Public Management since the 1980s affected the possibility for far-right policies to take hold? Finally, we want to address how the rise of the far-right in different parts of Europe may force forth a situation where heritage bureaucracies have to address the fine line between limits of political compliance and academic ideals of democratizing heritage.

01 INTRODUCING ARCHAEOLOGY AND THE EUROPEAN FAR-RIGHT: ATTITUDES AND RESPONSES FROM HERITAGE BUREAUCRACIES

Author: Dr Holleland, Herdis - Norwegian Institute for Cultural Heritage
Co-Author: Dr Niklasson, Elisabeth - Stanford University (Presenting author)
Keywords: Heritage bureaucracies, far-right
Presentation Preference: Oral

This paper introduces the session's main theme: heritage bureaucracies' attitudes and responses to the rise of the European far-right. More specifically, we draw attention to the following questions: What characterises far-right heritage policy? How do the often slow-moving structures of heritage bureaucracies impact the implementation of far-right policies? To what extent does the rise of the far-right force forth a situation where heritage bureaucracies have to address the fine line between limits of political compliance and academic ideals of democratizing heritage? Our paper will situate the session within current research on archaeology, heritage bureaucracies and the far-right and thereby contextualize the papers of the session.

02 FAR-RIGHT AND HERITAGE IN FINLAND

Author: Dr. Enqvist, Johanna - University of Helsinki (Presenting author)
Keywords: Heritage, Far-right, Finland
Presentation Preference: Oral

This talk takes a review of heritage politics in Finland, where the far-right, anti-immigration Finns Party gained 17,7 % support in National Parliamentary Election 2015, and formed the current Finnish Government with the National Coalition Party and the Centre Party of Finland. According to the Finns Party, "recognition of Finland as a nation and a culture" in an ever-evolving global framework is their predominant raison d'être. Despite the obvious links to heritage and cultural identity of which this statement and the programme of the party represents, the Finns Party's efforts and effect in regard to cultural policy have turned out to be rather insignificant. Furthermore, as Finland celebrates the centenary of its independence in 2017 the concepts and definitions of 'Finnish heritage' and 'Finnishness' on the one hand, and 'multiculturalism' on the other, are out – represented, discussed and questioned – in numerous contexts.

Nonetheless, there appears to be a great deal of worries in the heritage sector concerning the forthcoming revision of the 54-year-old Antiquities Act, which regulates the protection of archaeological heritage in Finland. Both academic archaeologists and heritage officials are afraid that the Act will not turn out for the better under the guidance of the current government; however, these concerns have little to do with the Finns Party's views on culture or heritage. Instead, they are grounded in the Finnish government's neoliberal policy which promotes individualism, privatisation, entrepreneurship, and the extension of competitive markets into all areas of life. Accordingly, the public sector, in which heritage bureaucracies operate, is seen as a burden. This talk will ask if far-right parties' fixation with the national identity and culture, and their purposeful uses of the past could somehow be utilised to demonstrate the importance of democratised, inclusive heritage policy and the public institutions implementing it.

03 APOLITICAL HERITAGE POLITICS: A NEW SWEDISH AGENDA FOR CULTURAL HERITAGE

Author: Dr Källén, Anna - Stockholm University (Presenting author)
Keywords: Heritage, far-right, politics
Presentation Preference: Oral

In December 2016 the Swedish Government presented a new proposition for cultural heritage, with the intent to reduce the future impact of far-right politics. The Minister of Culture, Alice Bah Kuhnke said in an interview that a main reason for presenting the new proposition was that "we now live in a Europe and a Sweden where dark forces (Swe: mörka krafter) try to seize and define cultural heritage and limit it to very narrow frames" (Ord & Bild nr 3–4, 2016, p 57). In this paper I will demonstrate how the proposition is crafted around a fundamental paradox – between a strong political statement for a new heritage policy based on the political ideals of the current government, and a recurring statement that official heritage institutions shall be apolitical and run by heritage professionals at arm's length from political instruction. I will argue that this paradox is symptomatic of a double-bind situation regarding cultural heritage that face social liberal governments in Europe today.

04 RECLAIMING THE VIKINGS – VIKING HERITAGE AND THE RIGHT WING CONCERN

Author: Dr Løkka, Nanna - Telemark Research Institute (Presenting author)
Keywords: Heritage management
Presentation Preference: Oral

The Vikings were an important part of Nazi ideology. References to the Viking age were extensively in the political rhetoric, both in the central Nazi organization and the Norwegian division, NS (Emberland 2003). After the Second World War, Viking history was closely associated with the Nazi ideology and consequently less emphasised in museums and schoolbooks than earlier and later in the decennium (Nordenborg Myhre 1994).
Today the Vikings are back in the front seat of Scandinavian and Norwegian history and heritage. The Vikings apparently appear in a growing number of arenas, both within public and popular culture like festivals, films and TV-series, and a recent trend is that more people actually want to live more or less as Vikings (Ytre-Eide 2010; Tveit 2016). At the same time, extreme right wing groups still use the Viking history in their ideology (f.ex. Dahl 2001). Many local communities and regional stakeholders wants to reclaim the local Viking history from the Nazis. The politics goes in favour of democratisation and increased collaboration with voluntary groups in the heritage management. The complex land-

scape of Viking enthusiasts accordingly becomes a dilemma. Is it possible to reclaim the Viking history while at the same time collaborating with different modern Viking groups? How to include modern Vikings in the heritage management, but stay clean of the 'wrong' ones? Will the public manage to separate between 'good' and 'bad' Vikings?
In this paper, I will discuss how different institutions have taken on different strategies to reclaim the Viking history from the right wing. I will primarily draw on examples from Norway and Sweden. Two main strategies are identified: either extensive collaborations with 'good' modern Vikings, or none at all. The empirical material is gathered through interviews with public institutions arranging Viking festivals collaborating with voluntary Viking groups.

05 HERITAGE BUREAUCRACY AND THE MODERN NATION STATE: TRANSCENDING DISCOURSE ANALYSIS IN HERITAGE STUDIES

Author: Dr Plets, gertjan - Utrecht University (Presenting author)
Keywords: Flanders, Bureaucracy, Foucault
Presentation Preference: Oral

Over the past two decades the field of heritage studies has expanded across different disciplines in the human and social sciences. Contemporary interpretations and uses of the past have become understood as cultural actions conditioned by our social, political and economic environments. Corresponding to post-modern developments, archaeology has also embraced 'heritage' as a legitimate research interest. Critical discourse analysis has been a predominant methodological lens in those analyses deconstructing the politicization of the past. By instantiating politics as a foremost discursive struggle; statements from political bodies, representations of the past in the media and the responses from archaeologists on the ground have stood central in many analyses.
Drawing on Foucaultian perspectives on government this paper wishes to break with this singular focus on discourse. Instead, it will explore how seemingly innocent bureaucratic procedures and mundane technologies (such as databases) administered by a polity normalize specific logics and rationalities. As such it hopes to illustrate that specific interpretations of the past are concurrently created through discourse and bureaucratic action.
A central case study in this paper will be cultural resource management in Flanders. Although on a discursive level the Flemish government—aware of the contestation in Belgium about right-wing nationalism—is very careful in not over-politicizing archaeology, bureaucratic procedures and technologies have drastically reshaped how archaeologists think about archaeological practice and how they present Flanders as a historical space.

06 HERITAGE PROTECTION DESTROYED BY STATE BUREAUCRACY IN HUNGARY

Author: Professor Banffy, Eszter - RGK - Romano-Germanic Commission DAI (Presenting author)
Keywords: Hungary, heritage unprotected
Presentation Preference: Oral

The examples taken illustrate that a government that is boasting to be patriotic can lead to destruct the venues of long-term planning and sustainable archaeological heritage management. These show how shut-downs of heritage institutions led to an absolute anarchy which leaves sites and archaeological landscapes without any solid protection, and leaves them to be free pray for developers (who often, by surprise, are standing far-right and also standing near the government). With hardly any more control over the sites and protected landscapes, the credit of professional archaeologists and heritage resource managers are deliberately derogated by new, state-founded parallel institutions which are excellently financed and equipped. These also have the task to attest unscientific, "alternative" histories about the past, which, eventually, become parts of the school teaching schemes. Archaeological heritage can thus become a victim of far-right ideology combined with corruption.

07 WE ARE FOLLOWERS OF THE SAME MUSE, PARDON ME, SCIENTIFIC DISCIPLINE. THEIR SCRIPT IS JUST NOT UPDATED YET!

Author: Doctor/Phd Tevdovski, Ljuben - Goce Delcev University
Co-Author: Ms Sokoloska, Angela - Institute of Cultural Heritage and Archaeology (Presenting author)
Keywords: archaeology, nationalism, far-right
Presentation Preference: Oral

While you expose the newest multidisciplinary approach to an archaeological problem in the university aula or chat enthusiastically with your well-read colleagues on the archaeological field, your native country, neighborhood or local media are totally dominated by narrow-minded radicals, ignorance and hatred. Sounds familiar? Have you ever wondered if you have anything in common with this chaotic and angry crowd? I challenge you to listen closely.
Because it might just happen that if you listen closely enough you might find out that the anachronisms and mantras of these confused radicals in politics or on the streets of Europe today are leftovers and rudiments of once great and saluted archaeological hypotheses.
In the last few decades, archaeology went through a rigorous and painful self-reflective process and was obliged to confront with numerous misconceptions that it created or that it is founded on. Moving from modernity to a new post-modern reality, the paradigm of "objective" science, uninfluenced and independent from the social and personal context, was replaced with an intensive research of the interactions and by-products of complex, but constant, relationship between science, culture and society.
We must not be frightened of this relationship. In contrary, while we've confronted many shortcomings of our theories, and moved on in new scientific endeavors, we must also explain our new ideas to the wider publics, enthusiastically and loudly as we were doing it in the previous two centuries.
The bureaucratic system and policies in place should make sure that enough resources are given for both public archaeology and the publicity of the new scientific directions and research. At the same time, archaeologists should remember that the stories we told in the past created the identities of millions of people and changed their future, and the stories we tell now carry the same weight and responsibility.

056 PLANTS AS FIBRE RESOURCES: APPROACHES FROM THE SCIENCE AND ARTS PERSPECTIVES

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Karg, Sabine (Germany) - Free University of Berlin
Co-Author(s): Brinkkemper, Otto (Netherlands) - Cultural Heritage Agency of the NetherlandsHarris, Susanna (United Kingdom) - University of Glasgow
Keywords: Plantfibre, ecology, landscape, technology, textile
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Objects made of plant fibres would have been abundant in the past. However it is only due to specific conditions that such objects are preserved in the archaeological record. Across Europe there are numerous finds from waterlogged preservation settlements, such as the threads, textiles, shoes, sieves, and fishing nets from the Neolithic and Bronze Age sites in the circum-alpine region or Mesolithic sites surrounding the Baltic Sea. Localised chemical environments also preserve plant fibre artefacts, such as the ropes and textiles of the salt mines of Austria, or fibre artefacts preserved due to close contact with metal objects in burials or hoards.
The focus of this session will be on the question of the techniques that were applied to produce such objects, the know-how of exploiting and processing plant fibres, and the question how these activities can be traced in the archaeological and palaeo-ecological record. To tackle these issues requires an interplay between analysis of archaeological material, associated tools and the processes of production, hard science and knowledge of today`s traditional societies and practitioners. Research may be through an analysis of the impact of plant fibre exploitation on the prehistoric landscape by applying modern scientific methods, as well as use-ware analysis on archaeological artefacts will be discussed. Through the consideration of both arts and science perspective we aim to stimulate discussion on the interrelationship of prehistoric raw material procurement strategies with a focus on plants as fibre resources, and the know-how of the technologies of plant fibre production.

01 KNOW-HOW ABOUT FLAX PRODUCTION OF NEOLITHIC FARMERS IN THE EUROPEAN CIRCUM-ALPINE REGION

Author: Dr. Karg, Sabine - Free University of Berlin (Presenting author)
Keywords: Neolithic, textile production
Presentation Preference: Oral

Since the 4th millennium BC innovations and changes in the subsistence economy are visible in several archaeological sites in the European circum-alpine region. North of the Alps an increasing demand in textiles made of linen seem to have triggered the development of flax cultivation.
The frequent evidence of archaeobotanical finds of flax (Linum usitatissimum L.) is contemporaneous with a rapid increase in spindle whorls shortly before the appearance of the first wheels. We suppose that the introduction of a new breed of the flax plant can be linked with these technological innovations that allow an optimal processing of the plant fibres into textiles.
A small seeded flax variety that had the properties to produce extra long fibres is evidenced from the early Late Neolithic period onwards (transition from Pfyn to Horgen around 3400 cal. B.C.). The measurements of flax seeds from older settlements are bigger and most probably derive from an oil variety.
From where does this new flax variety come from and where had it been created, where did the specialised cultivation develop and what consequences did this have on the entire economy of the settlements? These are the questions that will be explored within my research project by studying botanical and archaeological finds from more than 50 wetland sites in Germany, Switzerland, France, Italy, Austria and Slovenia.
Experiments are conducted on the cultivation and processing of old varieties (landraces) of fibre and oil flax, as well as the wild progenitor, with the main aim of enlightening the expenditure of energy for producing linen cloth in contrast to woollen ones.

02 THE USE OF GREEN FLAX

Author: Mrs Rast-Eicher, Antoinette - ArcheoTex (Presenting author)
Keywords: Flax, Neolithic, Experiments
Presentation Preference: Oral

Prehistoric flax has been processed by splicing. Experiments have shown the "chaîne opératoire" of the production of Neolithic flax threads. The question remained, if also green flax had been used. A new evidence of a Neolithic site gave new results. Further experiments and SEM-analyses with green flax and comparisons to prehistoric threads will be presented.

03 FROM STEM TO TEXTILE: TRACING SPLICED YARNS FROM THE NEOLITHIC TO IRON AGE

Author: Dr Harris, Susanna - University of Glasgow (Presenting author)
Co-Author: Dr Gleba, Margarita - University of Cambridge
Keywords: splicing, fibre, textile
Presentation Preference: Oral

At least since the Neolithic, plants such as flax, lime, willow and nettle were among the resources for making fabrics such a textiles, looping and twining across Europe. The transformation of plant into usable fibre was influenced by the economy of textile production, and depends on knowledge and skills surrounding techniques of manufacture. Agricultural choices concern which fibres to grow or collect, when to harvest and how to process the plants. Technological choices concern the way fibres are twisted, spliced or spun into simple and plied threads. This paper questions the interrelated processes of plant fibre extraction and thread production within broader questions of economy, and addresses how these techniques can be identified in archaeological material. Recent research into Neolithic fibre technology points to a long tradition of working plant fibers by splicing, rather than draft spinning. Spicing is here identified by macroscopic and microscopic examination of plant fibres used to make thread (flax) and relationship between techniques and fibres. Previously this technique was only recognised in ancient Egypt. Based on these methods, this paper presents new results for spliced fibres from western Europe and the Mediterranean 4000-500 BCE. These results demonstrate that techniques of splicing plant fibres into yarn extend from the Neolithic to Iron Age, and continued alongside the adaptation of draft spinning, a technology related to wool. Since the Bronze Age, wool was the preferred fibre for textiles, showing consumer preferences in textile consumption, and providing a catalyst for change in the technologies of fibre processing and the production of yarn. What motivated these changes is debatable, yet this represents a significant shift in know-how and the management of fibre resources and products.

04 FIBRE PRODUCTION - A SKILL FROM THE PALAEOLITHIC AGE?

Author: Dr Sobkowiak-Tabaka, Iwona - Institute of Archaeology and Ethnology Polish Academy of Sciences (Presenting author)
Co-Author: Dr Kufel-Diakowska, Bernadeta - Wroclaw University
Keywords: Palaeolithic, use-wear, tools
Presentation Preference: Oral

Unlike waterlogged preservation settlements, archaeological sites from sandy deposits yield no organic finds. The only method of detecting plant based technologies is use-wear analyses of lithic tools discarded by the past users.
The excavations carried out at Late Glacial site no 10 in Lubrza, located in the young moraine landscape of western Poland, provided more than 4000 Federmesser and Swiderian lithic artefacts. Use-wear analysis showed that there is a considerable number of artefacts with plant-like polish. Tools were used for whittling, splitting, scraping or stripping plant materials. Activities also included the extraction of plant fibres - perishable technology developed by farming societies in the Neolithic. However, simple plant-based crafts, also ones involving the use of plant products such as fibres, must have been known to Palaeolithic and Mesolithic people, whose subsistence relied on their understanding of environmental changes and seasonal vegetation. As the pollen and macro-remains analyses have shown trees, shrubs and herbaceous plants, as well as high silica content species were accessible in the area of the site, especially around water reservoirs the processing of which could have produced plant-like polish.
We would like to show that the working of plant material in the Late Palaeolithic was a more complex process than it was previously believed, and skilled craftsmen were able to make more than wooden hafts and simple construction elements.

05 FIBRE PLANTS IN PREHISTORIC IRELAND: INSIGHTS FROM ARCHAEOBOTANY AND OTHER SOURCES

Author: Dr McClatchie, Meriel - University College Dublin (Presenting author)
Keywords: Archaeobotany, Ireland, prehistory
Presentation Preference: Oral

This paper will provide the first ever review of fibre plants from prehistoric Ireland, based primarily upon archaeobotanical evidence. The potential use of fibres from wild plants during the Mesolithic period (8000 - 4000 BC) will be explored. Cultivated plants arrived into Ireland at the beginning of the Neolithic period (4000 - 2500 BC), including flax, but there is also extensive evidence for continued use of wild plants in various activities, possibly including fibre production. It is during the Bronze Age (2500 - 700 BC) and Iron Age (700 BC - AD 400) in Ireland that we start to find actual textile fragments, as well as further archaeobotanical evidence for plants possibly used in fibres. This paper will focus on archaeobotanical evidence for fibre production in prehistoric Ireland, but will also explore archaeological evidence for tools utilised during the various stages of fibre and textile production, as well as related archaeological features. The paper will also draw upon documentary and folkloric evidence from the historic period to provide an integrated approach to understanding the role of plants as resource fibres.

06 "SPINNING BOWLS" IN THE CENTRAL BALKANS –THE INTRODUCTION OF NEW TECHNOLOGY FOR PROCESSING THE PLANT FIBRES IN LATE NEOLITHIC

Author: Ms Svilar, Marija - Institute of Archeology (Presenting author)
Keywords: textile, bowls, fibres
Presentation Preference: Oral

Over the past twenty years, research on textile has received increasing attention in archaeology worldwide providing new insight into one of the most important crafts in human history. However, when it comes to textiles in Central Balkans, our understanding of textile technology is still very limited mainly because tools used in the production process were only superficially examined. Though some progress has recently been made and new generations of archaeologists who specialize in archaeobotany, pottery and animal bones have made significant contribution to the given subject, investigation of textile in prehistoric contexts is still far from its full potential. The quest for spinning bowls in Late Neolithic ceramic assemblages constitutes important part of the given research, providing new evidence on processing the plant fibres, as well as the role ceramic vessels had in the given process. Therefore, the focus of this paper is on the earliest occurrence of spinning bowls in Central Balkans, i.e. the technology of wetting and tightening plant fibres in ceramic vessels. These objects shed new light on production of textile in Central Balkans, implying much higher level of complexity than previously thought. Due to the fact that spinning bowls were found throughout Carpathian-Balkan region, some authors claim that this new technology was developed in Late Neolithic/Early Eneolithic settlements on the given territory, from where it was later spread throughout Aegean and the Near East.

07 POTTERY, PLANTS AND TEXTILES INTERTWINED. TEXTILE IMPRINTS AND TOOLS FROM THE MIDDLE BRONZE AGE TELL SETTLEMENT OF FÜZESABONY-ÖREGDOMB (H)

Author: Pásztókai-Szeőke, Judit - Sopron University, Lámfalussy Sándor Faculty of Economics (Presenting author)
Co-Author: Szathmári, Ildikó - Hungarian National Museum; Kulcsár, Gabriella - Hungarian Academy of Science; Polgár, Péter - independent archaeologist; Kiss, Viktória - Hungarian Academy of Science
Keywords: plants textiles pottery
Presentation Preference: Oral

Our study, which has a focus on local textile production and consumption during the Early and Middle Bronze Age in the Carpathian Basin, has been launched last year as part of a recent multidisciplinary research project (From bones, bronzes and sites to society: Multidisciplinary analysis of human mobility and social changes in Bronze Age Hungary (2500–1500 BC; http://mobilitas.ri.btk.mta.hu) by the Hungarian Academy of Sciences.
The primary goal of our paper is to present the pilot study of this research concerning the technologies used for producing non-woven textiles imprinted on the surface of ceramic vessels from the Middle Bronze Age tell settlement of Füzesabony-Öregdomb (northeast Hungary). From this archaeological site, the number of the shards identified with textile imprints is over eighty so far. Whenever the source of the raw material is identifiable, its origin is from plants. Although the determination of the techniques of fabric production is frequently aggravated by overlaying small patches of different imprints, the most often used one is twining. No woven textile has been identified yet.
As a second step, the numerous possible textile tools from this site has also been registered and the first results of our research would be presented here.

08 AN INTEGRAL APPROACH TOWARDS THE ANALYSIS OF ANCIENT MAT-WEAVING: THE CASE OF THE KITOVA MOUND (THRACIAN VALLEY, BULGARIA)

Author: Andonova, Mila - Department of Archaeology, University of Nottingham, UK; Division of Paleobotany and Palynology (IBER), Bulgarian Academy of Sciences (Presenting author)
Co-Author: Ass. Prof. Marinova, Elena - Center for Archaeological Science, GEO - Institute, KU Leuven; Dimitrova, Diana - National Institute and Museum of Archaeology, Bulgarian Academy of Sciences
Keywords: mat-weaving, archaeobotany, Thrace
Presentation Preference: Oral

This presentation proposes an integral approach towards the identification and reconstruction of production techniques applied to plant material employed in ancient mat-weaving. The approach has been tested within a case study of the mat fragments from the Kitova mound (2 century AD, Thracian Valley, Bulgaria), which were preserved by desiccation due to the specific micro-climatic conditions of a sealed burial mound.

One of the first questions to be concerned will be the taxonomic identification of the plant material employed in the process of mat-production from the Kitova mound. This was done in a combination of non-destructive and destructive methods. Longitudinal plain and polarized light microscopy was applied to the preserved epidermal tissue, together with targeted sampling for obtaining plant material for thin-sectioning. Second step of the analysis will be the classification of the mat-weaving technique(s). Owing to a unique fragment preserved from the edge/finish of the mat, it was possible to distinguish between two weaving techniques chosen when producing it. This fact naturally rose the third point of this approach: how was the plant material processed before and during the weaving process. Here X-ray microtomography and Image Analysis were applied in order to gain further insights on the raw plant processing and the production sequence.

The aforementioned combination of methods will be directed into a qualitative discussion, regarding material-specific aspects of the studied remains as flexibility and its adjacent utility(ies). This discussion will be empowered also by en experimental study, conducted to test the proposed methodology and by that to represent its conclusive stage.

09 THE BAST FIBER CLOTHES OF VICAR NIKOLAUS RUNGIUS

Author: PhD Student Suomela, Jenni - University of Helsinki (Presenting author)
Keywords: Identification, bast fibres
Presentation Preference: Oral

In Northern Europe, bast fibres have been commonly used in textiles, especially before the arrival of imported cotton in the industrial era. However, their identifying process has been problematic. In order to generate more reliable identification results, further research and advancement in multi-methodological methods is required.
The research materials in this study consist of the finds of only one single grave. The mummified remains of vicar Nikolaus Rungius (c. 1560–1629) have been Christian pilgrim site since the 18th century in the St. Mikael's Church at Keminmaa, Finland. Rungius himself and the textiles from this grave, have been previously under study, but this is the first time when the aim is solely on plant fibre textiles and in their identification. Previously some of the clothing items have been identified as bast fiber textiles, but not more specifically. This study utilizes a set of tools - a methodological manual, to identify and distinguish flax (Linum usitatissimum), hemp (Cannabis sativa), and nettle (Urtica dioca) from each other. It includes longitudinal and cross sectional observations with transmitted light microscopy, and a modified Herzog test with polarized light, in order to identify the distinguishable features in their morphological structures. So far, this combination of methods has been experimented with well-preserved ethnographic textiles. This study investigates how to utilize these methods also in examination of archaeological textiles.
Previous studies have acquired knowledge about Rungius's life, health conditions and even the probable cause of death. This study presents the conception and results of what can be learned from identifying the materials of his clothing. Is it possible to interpret, and in which extent the clothing of the upper classes in the 17th century, the materials in use at that time, and the processing methods, in the light of the results of this study?

10 HEMP TEXTILES IN SCANDINAVIEN HISTORY – HOW TO INTERPRETED AND IDENTIFIED TEXTILE FIBRES FROM FH (FLAX/HEMP)

Author: Textile historian Skoglund, Git - Fellow of Agnes Geijers Nordic Foundation (Presenting author)
Keywords: Hemp, Medieval, Textile
Presentation Preference: Poster

There is not yet evidence that can tell which of hemp or flax that is the oldest textile plant in the northern Scandinavia; despite that there is a general opinion that it is flax. Archaeological discoveries made by seed and pollen from the area shows that the plants have been grown about the same time. Medieval textiles have been found above ground, and they are archived in collections as flax fabrics without further investigations. Recently a conclusive method have been used that could identified hemp fibres, the oldest are two parts of the medieval tapestries Överhogdal Ia and Ib.The result showed that hemp have been used in both simple every day textiles, and in textile art items like wall hangings and coverlets. In Scandinavian textile research, hemp textiles are often referring as marginal and with a geographical location to the northern cold climate. However, it is misleading to refer hemp to the climate, instead it is the preservation of a subsistence culture that is often found in northern, or mountain areas that have preserved the tradition with hemp textile production.

058 EUROPEAN THINGS IN MOTION: TRANSNATIONAL MATERIAL CULTURE DURING 14TH AND 17TH CENTURIES

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Escribano-Ruiz, Sergio (Spain) - University of the Basque Country (UPV/EHU)
Co-Author(s): Linaa, Jette (Denmark) - Moesgaard Museum
Keywords: Late-Medieval, Early-Modern, Material Culture, Exchange
Presentation Preference: Session with papers of six minutes and six slides

MERC
Medieval Europe Research Community

Late Medieval and Early Modern periods are characterized by a growing movement of objects throughout Europe. The development of maritime techniques and infrastructure, the creation of new solid commercial networks and the consolidation of a consumer society enabled the transmission of material culture from one country to another. The existence of a big transnational exchange net is clearly mirrored materially as Trans-European artefacts are frequently recovered in archaeological excavations and recurrent in private or public collections. For example, German stoneware is found in Bilbao in the same way as Spanish lusterware is found in Lubeck. Nevertheless, the study of the assemblages tends to follow a local, regional or national based approach that inhibits tracing the overall movement of material culture and hinders having a clear understanding of what is happening in a wider geographical sphere.
This session aims to overcome the limitations imposed by this particularistic historiographical inertia, providing a ground to map the artefacts moving through Europe, discuss the overlaying processes and create a basis for further theorization. Individual descriptions may suggest the existence of certain routes, draw clear objects itineraries or underline specific trends that aim to be discussed in a choral and hopefully fluid debate. In order to ensure achieving this objectives time and space framework will be limited to Late Medieval and Early Modern Age Europe. Namely, European objects inside Europe from the 14th to the 17th centuries.

01 PEACOCK, UNICORN, DEER AND GRIFFIN – MOBILITY OF TEXTILE RAW MATERIALS AND CULTURAL INFLUENCES TO MEDIEVAL FINLAND

Author: PhD Vajanto, Krista - Nanomicroscopy Center Aalto University (Presenting author)
Keywords: intarsia, cotton, microscopy
Presentation Preference: Oral

In this presentation the aim is to show, how valuable textile materials and cultural influences travelled across the medieval Europe to the Nordic countries. We are focusing on a 1.5 x 3 metre large textile coverlet, possibly an antependium, made in intarsia technique, possibly by the Bridgettine Sisters in Naantali monastery around 1440's AD and found in a hoard in Masku church, southern Finland in late 19th century.
The textile consists of 8 panels presenting mythological animals, each of them being surrounded by a text written in Latin or Swedish. The fibres of the coverlet were recently examined with optical an electron microscopy and dyestuffs chromatographically. Predominant materials are fine blue and green broadcloth, close to merino quality. In addition, red, purple, white and yellow broadcloths were used in details. Each seam has been covered with a narrow strip of silver plated leather stitched with silk yarn. Small pieces of cotton fabric were used in some details, adding remarkably to the number of known medieval cotton finds from Finland.
Presumably, none of the materials are local. The wool may be from Central Europe, silk even from China, cotton is from India. The style of the intarsia coverlet shows imported knowhow from Sweden from the motherhouse of Bridgettine Order, but the unique seam structures suggest that the textile was stitched in Finland. The patterns represent Christian motifs, joining the narration to medieval catholic storytelling. The textile shows how effective the medieval socio-economical network was and what a variety of imported materials was available all over the Europe.

02 APOSTLE SPOONS IN LITHUANIA

Author: PhD student Ardaviciute-Ramanauskiene, Skaiste - Vilnius University; National Museum of Lithuania (Presenting author)
Keywords: apostle-spoon, early-modern, Lithuania
Presentation Preference: Oral

Apostle spoon is a spoon with a figure of one of the twelve apostles or, although rarely, other Christian religious figures, such as Virgin Mary or Jesus Christ, at the end of the handle. They were usually made from silver, copper alloy or pewter and were produced from the 15th until the 17th century in Germany, Netherlands, Switzerland, Italy and England. Although they were produced locally, it was not uncommon to import them from other production centres for trading. Apostle spoons were popular on the Continent, particularly in Germany and Netherlands, but they were never as much in vogue there as in England. Judging by the limited research and finds, the level of popularity of apostle spoons in the Northern and Eastern Europe was low.
Apostle spoons are a rare find during excavations, research on them is very limited, dispersed and in many cases focused towards collectors and antiquarians, making it difficult to construct a general picture of the apostle spoon phenomena in the late medieval and early modern times in Europe.
The aim of this paper is to present the analysis of a previously unstudied artefact type in Lithuania - apostle spoons – and to discuss the aspects of their provenance, their intended purpose (for eating, as an investment, a souvenir or a christening gift?), importance and significance of the represented apostles to the spoon's owner. Were it traders who brought the apostle spoons to the Grand Duchy of Lithuania? Or was it travelling nobility that brought them as souvenirs or gifts? Geographically dispersed and socially diverse locations, where apostle spoons were found, raise even more questions.

03 MODERN SHOES FROM ELBLĄG (VOIVODESHIP: WARMIŃSKO-MAZURSKIE, POLAND)

Author: Master of Arts Kulesz, Aleksandra - Nicolaus Copernicus University in Torun (Presenting author)
Keywords: shoes, craft, lethaer
Presentation Preference: Oral

In the course of many seasons of excavations carried out in the old town of Elbląg acquired thousands of leather artefacts. In this collection was identified some amount of elements from modern shoes. Those fragments were measured and described. If it was possible objects were identified in respect of form and style. Examined ways of sewing and decorating particular types of shoes. Those observations were base to make some conclusions about craftsmen involved in process of production of discussed shoes.

Dendrochronological analyses of wooden objects from layers, in which modern shoes were discovered, determined time of deposit. Forms and size of shoes let speculate about users of those personal objects.
Results of examination were compared to materials from same times in different areas in Poland and Europe, what allowed noticing similarities, but also local trend in shoe fashion. If condition and completeness of antiquities were good enough, drawing reconstruction of object was made.

04 WHAT CAN TEXTILE SEALS TELL US ABOUT TRADING ROUTES? CASE STUDY FROM GDAŃSK, POLAND.

Author: PhD student Polczynski, Lukasz - University of Gdańsk (Presenting author)
Co-Author: Ms Michalak, Katarzyna Inga - University of Gdańsk
Keywords: cloth seals, trade
Presentation Preference: Oral

Late Medieval and Early Modern period economic growth brought the development of new trading routes and new major commercial centres and ports. Gdańsk (formerly Danzig) was the most important commercial centre on the Baltic Sea at that time. Almost all exported and imported goods of the Polish-Lithuanian Commonwealth passed through the port. The main imported goods were various kinds of textiles.
Each piece of imported cloth had to be officially legitimised and sealed with a cloth seal. These were small pieces of lead attached to cloth in order to mark the quality and provenance of textiles. Pictures impressed on the seals allow us to determine the origin, quality, quantity, and sometimes even a manufacturer of the specific textile.
Unfortunately, despite the fact that these artefacts are numerous and might be very informative sources to understand trade connections, they are surprisingly underrepresented in historical research.
Based on the cloth seals found during excavations in Gdańsk, we will present the cloth trading routes of the Baltic Sea region and beyond.

05 ARTISTIC POTTERY MARKET IN SILESIA (SOUTH-WESTERN POLAND) IN LATE- AND POST-MEDIEVAL PERIOD. FILLING THE GAP.

Author: Mackiewicz, Maksym - Institute of Archaeology, University of Wrocław; Archeolodzy.org Foundation (Presenting author)
Keywords: Artistic pottery, Silesia
Presentation Preference: Oral

Artistic pottery forms a special category of high quality, uniquely aesthetic ceramic artefacts. The development of a market for such pottery in Late- and Post-Medieval periods reflects the general current of social and cultural changes brought about by the appearance of a new strata of elites. The members of these elites, especially the more affluent among the Burghers, took an active part in creating not only the demand for luxury wares, but also a set of new lifestyle choices reflected in the concurrent symbolism and customs.
The artistic pottery usually can be dated and sourced accurately. This allows us to retrace its distribution routes and zones. It is thus quite intriguing, that the commercial relations of Silesia, known so well from contemporaneous texts, correspond so weakly with the archaeological record. For instance, the Rhineland stoneware, commonly interpreted as a material marker of exchange within the Hanseatic League, is found very rarely.
Saxon, Lusatian and Moravian stoneware were the most frequently imported to Silesia, although they usually constitute less than 1% of pottery found, even within the richest plots. German stoneware, Maiolica, faience, lusterware and oriental porcelain is exceedingly rare. The demand for luxury ware was filled by local products.
The Silesian artistic pottery market thus appears to have developed away from the main long-range trading routes and to have had its own particularities and coverage. It did not exclude wares from the more distant parts of the world at that time; they merely came sporadically, perhaps from secondary sources. Artistic pottery studies can be incorporated into the broader contexts of the flow of artefacts and ideas. It seems crucial, at this point of the discussion, to introduce some of the relevant archaeological record from Silesia – a region which, so far, has been perceived a terra incognita in that subject.

06 REPUBLIC OF COLLECTORS: KILIAN STOBAEUS, HIS MUSEUM AND HIS NETWORK FOR OBTAINING CURIOSITIES

Author: Naum, Magdalena - Aarhus University (Presenting author)
Keywords: collecting, early-modern, networks
Presentation Preference: Oral

Early modern collectors developed a particular taste for exotica coming from the colonies and through the European trading posts around the globe. But the 17th and 18th century cabinets of curiosity and museums also included European rarities and curious objects of art and nature. In this talk, I will focus on a Swedish collector, Kilian Stobaeus (1690-1742), and his practice of acquiring European rarities. I will discuss what he collected and how he collected, paying particular attention to the personal inter-European network he has developed and maintained for the purpose of exchanging and acquiring objects.

07 ARCHAEOLOGICAL FIENDS: WANDERING WARES ON WATERWAYS

Author: Mag. Demuth, Volker - Arkeologisk museum, Universitetet i Stavanger (Presenting author)
Keywords: pottery, networks, variations
Presentation Preference: Oral

As mentioned in the preface of the session, German stoneware and highly decorated earthenware from late medieval and early modern period are present in large areas of Europe. Thus they haunt the archaeological literature, occasionally in a quite nebulous way. Based on some finds from consumer and trading sites in Norway, I want to address the importance of a differentiated view on the finds. Treating each object as an individual "actor" in a network may give us access to a more comprehensive understanding of both the single object and the broader picture. Comparing the occurrence (or absence) of well-defined types and wares in producer, trader and consumer sites, may provide possibilities of interpreting the interacting elements of these networks. Focusing on 3 individual find objects, I will try to trace their way through various hands, until they end up as archaeological finds. I hope that we can make these fiends our friends on the track towards an increased insight in past realities.
These finds are:
A: a lower Saxon stoneware (Bengerode) drinking jug, found underwater at the trading site „Martnasund" („marked sound") in mid-Norway, 14th century
B: a lower Saxon stoneware miniature jug, found at a monastery (Utstein kloster) north of Stavanger (county Rogaland, S-Norway), 14th / 15th century
C: a decorated bowl in Weserware, found underwater in a „waiting harbour", "Leiasund" („Lane sound") on the Island of Kvitsøy (county Rogaland, S-Norway), 16th/17th century

08 TRANSNATIONAL MATERIAL CULTURE : THE CASE OF NORTH OF FRANCE

Author: Ms Vincent, Vaiana - INRAP; CRAHAM - UMR 6273 (Presenting author)
Keywords: ceramics, trade, Medieval/Modern
Presentation Preference: Oral

Northern France, due to is geographical position, clearly belongs to the North Sea dynamics. The number of 'transnational' importations can vary according to the archaeological context and whether they are found in rural or urban settlements, 'poorer' or 'richer' contexts, etc. The 14th century is marked by highly decorated ceramic that, despite the existence of some local productions, can come from other countries such as Great Britain, Flanders or the Netherlands. The arrival of stoneware, gradually replacing previous pottery types, is a sign of new trade roads. The German stoneware knows a large success in our region but Belgian and French productions like stoneware from the Beauvaisis area can be present too. The end of the 15th century sees the first importations of majolica. The biggest part seems to be produced in the Netherlands, nevertheless some examples can be associated with Italian objects too. Finally, the 17th century with the new technique of white slip decoration, which is mostly produced in France, also yields items that seem to come from Werra ware productions.
The small area of Northern France is a good example to help understanding the movements of artefacts through medieval Europe.

09 A COMPULSORY STOP. THE ROLE OF ASTURIAS (NW OF IBERIAN PENINSULA) IN THE EUROPEAN POTTERY TRADE DURING MODERN AGE.

Author: Mr Busto-Zapico, Miguel - University of Oviedo; University of Bologna (Presenting author)
Keywords: Asturias, Pottery, Trade,
Presentation Preference: Oral

Between 14th and 17th centuries, the region of Asturias, located in the northwest of the Cantabrian coast of the Iberian Peninsula, was part of a network of transnational exchanges. The latest research developed in this region has revealed the presence of a rich and diverse material culture from Europe, Asia and America. Furthermore, several studies of the pottery record confirm the existence of these global exchanges.
The commercial archaeological excavations of the last 50 years that have taken place in Asturias and mainly in the cities of Oviedo, Gijón and Avilés, have brought to light a great amount of archaeological material. Among these archaeological finds, in recent years the research has been focusing on the study and classification of the medieval and modern pottery material record. However, these sets have been studied in a very partial way, and there was not any global study until nowadays.
Among this great amount of material, we can find pottery pieces from very different and distant places. For example, in the productions of the Iberian Peninsula, pieces of Seville, Talavera de la Reina or Portugal are abundant. Within the Trans-European exchanges, vessels of England, Holland, France or Italy are also numerous.
In this proposal, we will show the diversity in ceramics that we found in a peripheral region of the Crown of Castile. It clearly shows us how Asturias was open to the world through its Cantabrian ports in the modern period. In fact, these relations let Asturians to consume, together with their local productions, lusterware, delftware or stoneware.

10 POST-MEDIEVAL EUROPEAN OBJECTS IN THE BASQUE COUNTRY

Author: Ph.D ESCRIBANO-RUIZ, SERGIO - University of the Basque Country (UPV/EHU) (Presenting author)
Keywords: basque, commodification, networks
Presentation Preference: Oral

Basque recent archaeological record is, in some way, characterized by its global nature. Albeit artifacts recovered in Late Medieval and Early Modern Ages came from all over the world, we will only look at those coming from Europe. To some extent it is normal to find in the Basque Country pottery made in neighboring countries as France or Portugal, or even in more distant places as Germany. Apart from domestic pottery, we find some other ceramic products such as stove tiles, clay pipes or tiles coming from different parts of Europe. Glass and coins produced in France or Portugal complement a trans-European archaeological record that has to be studied in greater depth. They speak of the existence of underlying networks that allowed the occurrence of so many "foreign" objects in Basque markets and households. Some of these imports changed the value of already existing material world and transformed the production framework at different regional areas of the Basque Country. Who was at the end of this induced technological innovation practice, what was their intention and how this progressive process of commodification took shape, are questions that require further attention and should be object of debate.

068 CONSTRUCTING SOCIAL THEORY FOR THE "DIFFERENT IRON AGES": CRITICAL INSIGHTS IN A COMPARATIVE PERSPECTIVE

Theme: 6. Interpreting the archaeological record
Author: Sastre, Inés (Spain) - CSIC
Co-Author(s): Currás, Brais X. (Portugal) - Coimbra University-CEAACP
Keywords: Egalitarianism Heterarchy Anarchism Landscape-Archaeology
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Along the last two decades, Iron Age research on Western Europe has moved away from classical evolutionist narratives towards a new understanding of social formations. Strong hierarchies, warrior aristocracies, chiefdoms, centralized landscapes... are not seen any more as a necessary and consubstantial part of Iron Age. Under the light of a new social theory, "non triangular societies", heterarchy, segmentarity have been identified inside complex political landscapes showing that "different iron ages" exist.
Taking the European Iron Age as a reference point, the aim of this session is twofold. On the one hand, we want to delve deeper in the methods for characterizing alternative models of society. We propose to discuss the traditional search of "negative" indicators for documenting absence of hierarchies (lack of settlement functional diversity, centralization, prestige goods, wealth inequalities), and looking for the specificities of non-hierarchical archaeological records. This is linked with a second aim: to promote the construction of a renewed social theory, both archaeologically based and supported by strong sociological and anthropological theory. Egalitarianism and anarchism could be envisaged as new interpretive options.
Theoretically-loaded contributions (not necessarily connected with Iron Age) are welcomed, as well as different case studies archaeologically based.

01 RECONSTRUCTING IRON AGE SOCIETY: WHAT WENT WRONG.

Author: Professor Collis, John, Ralph - Retired / Sheffield University (Presenting author)
Keywords: Celtic Social reconstruction
Presentation Preference: Oral

In the late 19th and early 20th centuries the language-based 'Culture-Historical' paradigm was dominant in archaeology for instance in the works of Gustaf Kossinna and Gordon Childe. Under this approach 'Celtic Society' could be reconstructed by fusing information provided by disparate written sources such as Caesar and early Christian texts from Ireland to reconstruct an idealised hierarchical 'Celtic' society which could then be used in other Celtic-speaking societies such as that of the Early Iron Age in southern England, even where the interpretations obviously did not fit the archaeology. Under the New Archaeology of the 1970s 'Processual' and 'Marxist' ideas of social evolution were developing, along with new methodological approaches especially for interpreting burial evidence and settlement hierarchies. With these new paradigms in my article published in 1994 'Reconstructing Iron Age Society' I attacked the traditional ethnic interpretations and concepts like 'warrior societies' used in the Iron Age studies. These ideas were further developed in the 1990s by others, especially by JD Hill in his rejection of 'triangular' hierarchical societies. However some of the old ideas still linger on especially in the popular literature. This contribution is intended as the historical background to the session.

02 RECOGNIZING EGALITARIAN POLITICAL STRATEGIES IN IRON AGE WEST AFRICA: MATERIALIZATION OF DISPERSED POWER AND INTEGRATIVE MECHANISMS AT KIRIKONGO, BURKINA FASO

Author: Dr. Dueppen, Stephen - University of Oregon (Presenting author)
Keywords: West Africa, Egalitarian
Presentation Preference: Oral

Archaeologists increasingly recognize the significance of non-centralized forms of complexity and employ diverse theoretical frameworks to understand their origins and dynamics, including explorations of cooperation, communalism and egalitarian strategies in political systems. This paper focuses on the practices and institutions by which more horizontally organized political systems were integrated in Iron Age West Africa, and in doing so, considers the material indicators of strategies employed by these communities. Kirikongo, Burkina Faso (ca. 100-1700 CE) provides an excellent case study, as the community rejected a centralized political system in the 12th century CE and constructed a new society based upon more egalitarian principles, enabling comparison of the different political strategies in use at different times. The egalitarian socio-political structure at Kirikongo was created through the division of power rooted in ritually potent sources among multiple social groups (including new craft specialist groups) coupled with the creation of diverse cross-cutting integrative mechanisms, including economic interdependency, collective actions, shared practices, and open spatial syntax. Data from Kirikongo indicate that like the exclusionary strategies of centralized systems, non-centralized polities are actively constructed, constantly legitimized, intricately structured to avoid inequalities, and result in positive indicators of human actions that are materially identifiable in the archaeological record.

03 ANARCHY IN THE BRONZE AGE? SOCIAL ORGANIZATION AND COMPLEXITY IN NURAGIC SARDINIA

Author: Araque, Ralph - Universität Freiburg (Presenting author)
Keywords: Sardinia, Anarchsim, Complexity
Presentation Preference: Oral

By the Late Bronze Age, Sardinia had become a protagonist in an exchange-network spanning from the Levant to the Atlantic. Although the inter-cultural communications which evolved along this network represented a challenge to Sardinian society, it still managed to preserve many traditional elements of its nuragic culture, while also developing a distinctive identity and ways to benefit from the situation into the Early Iron Age.
The sheer amount of architectural remains and artifacts from the nuragic LBA-EIA of Sardinia confronts the archaeologist with a puzzling image of a unique society. Especially the bronze figurines have been the main source of all attempts to reconstruct the nature of nuragic LBA-EIA society.
The social organization of this Mediterranean community is still barely understood. Although it was in close contact with the contemporary early states of the Eastern Mediterranean, there is no evidence of any attempts to form a state and social hierarchy cannot be easily detected. However, in the archaeological record a Sardinian "warrior elite" has been sought for in vain.
So why is the existence of such an elite-class taken for granted by most researchers? A widespread but utterly evolutionist concept is that societies which reach a high technological and cultural level do so because they become hierarchical, with a small group, the "elite", organizing the cultural progress. The difference between political and cultural complexity is seldom acknowledged.
One of the central aims of this contribution is to analyze the inter-cultural communications and the social organization of past societies beyond evolutionist and colonial concepts. The approach taken towards the study of prehistoric societies employs key-concepts of Anarchist theory. The aspects under which these societies will be examined include the practices of local autonomy, network organization as well as mutual aid, communal decision making, justified authority and the refusal of centralization.

04 SOCIAL THEORY AND THE GREEK IRON AGE

Author: Professor Dr BINTLIFF, JOHN - Leiden University (Presenting author)
Keywords: Social theory globalisation
Presentation Preference: Oral

Thls presenation will discuss key aspects of the evolution of Greek society through the early to late Iron Age. Topics will include political change, state formation, city to territorial states, networks, globalisation and proto capitalism, land use and territory. Links to other Europe Iron Age developments will be raised.

05 THE PEASANTRY AS A SOCIAL THEORY, AND ITS APPLICATION TO CELTIBERIAN SOCIETY

Author: Professor Dr Burillo-Mozota, Francisco - Universidad de Zaragoza (Presenting author)
Co-Author: Ms Burillo-Cuadrado, Mª. Pilar - Universidad de Zaragoza
Keywords: Peasantry, Social Theory
Presentation Preference: Oral

The socio-economic structure of the peasantry, based on the nuclear family as a unit of reproduction in farming communities and the ties of solidarity that developed amongst the members of those communities, determined its historical and universal survival.

The peasantry appeared when the primitive farmer opted for living a communal life. In the Celtiberian territory of the Serranía the conflicts that broke out around 2000 BCE led to the appearance of the first hamlets with an economy based on the sedentary stock-raising of sheep, goats, cattle and swine and the cultivation of cereals and legumes, together with hunting deer, hares and rabbits and collecting acorns. It was the standard economy of the Celtiberian period.

Around 1100 BCE a type of settlement referred to as a "village with a central space" appeared in the Ebro sedimentary basin, with houses of a similar size and similar grave goods, that is the archaeological embodiment of an egalitarian social structure. The persistence of this model of fortified village at the height of the Celtiberian period reflects the survival of that social structure in a political environment in which the State already existed, with oppida that were producing their own coinage.

The Celtiberian epigraphic documentation reveals the extended family to be the basis of the peasantry's egalitarian social structure. It developed an ethos that prevented the concentration of wealth and the emergence of a distinctive aristocracy. That, at least, is what their necropoleis suggest: they contain no luxurious burials or outstanding grave goods. And their small cities have no monumental buildings that would demonstrate the existence of a hierarchy that taxed the peasantry.

06 ALL TOGETHER NOW (OR NOT): CHANGE, RESISTANCE, RESILIENCE IN THE NW IBERIAN PENINSULA BETWEEN THE BRONZE AGE - IRON AGE

Author: Parcero-Oubiña, César - Instituto de Ciencias del Patrimonio (Incipit), Spanish National Research Council (CSIC) (Presenting author)
Co-Author: Armada, Xosé-Lois - Instituto de Ciencias del Patrimonio (Incipit), Spanish National Research Council (CSIC); Nión, Samuel - Doctorate student, Universidade de Santiago de Compostela; González Insua, Félix - Universidade de Vigo
Keywords: change, resistance, resilience
Presentation Preference: Oral

The interpretation of the archaeological record of the Later Prehistory in the north-western Iberian Peninsula in terms of social and political complexity has witnessed a significant leap in the recent years. As has been the case in many other parts of Western Europe, two particular topics (among others) have been at the centre of the discussion: on the one hand, the relevance of the notions of social resistance and resilience as a key factor to understand the trajectories of the social groups in the area. On the other hand, the incorporation of a finer grained view about the different historical trajectories within the region.
In this paper we will explore these two issues together. Drawing on the hypothesis that the transition between the Later Bronze Age and the Early Iron Age can be interpreted in terms of a reaction against trends towards social division, we will explore to what extent this was a general process within the region. To do that, we will explore the extent to which the archaeological evidence used to propose that idea can be equally found in the whole area of the north-western Iberian Peninsula at the same, or similar, time. We will focus on temporal and regional variability in some dimensions of the archaeological record: circulation and deposition of metal objects, emergence of settlement fortification, long distance trade, and architectural structure of settlements. Our aim is to discuss and further refine the initial hypothesis, and to possibly get some insights into the subsequent trajectories of human communities in this region.

07 EARLY IRON AGE SOCIETIES FROM EASTERN POMERANIA. ELITE WARRIORS OR EGALITARIAN FARMERS?

Author: Dr Niedziółka, Kamil - University of Gdańsk (Presenting author)
Keywords: Pomerania, urns, stratification
Presentation Preference: Oral

Early Iron Age was a time of significant cultural changes in Eastern Pomerania (Northern Poland). From the point of view of culture-historical archaeology, these changes can be linked with origins of Pomeranian culture, which was developed on the background of local group of Lusatian culture, identified with Urnfield tradition. These transformations were especially visible in the burial rite: instead of large barrow burial sites customary for the end of the Bronze Age, analysed area was covered with numerous but small cemeteries consisting of cist graves with face urns inside. These vessels are one of the most interesting phenomena in Polish prehistory. Their sudden appearance in archaeological contexts, dated at the very beginning of Iron Age, may suggest an important and deep change in social structure of societies from Eastern Pomerania.
The main aim of this paper will by analysis of the presence of face urns from the point of view of social stratification. Sophisticated burial rite and general care for the cemeteries, that is visible in archaeological record, may indicate that individuals buried in face urns were members of the local elite. On the other hand, high number of these artefacts and their depositions in surprisingly similar or even regular contexts may suggest egalitarian type of society inhabiting discussed area.
To conclude, mentioned above subject will be discussed on the background of wider analysis of cultural situation that existed in the investigated area at the turn of Bronze and Iron Age. It seems that careful studies conducted upon the significant presence of face urns, together with other archaeological elements in Eastern Pomerania, may offer a new opening in research on the social structure of prehistorical societies from this part of Europe.

08 NEITHER TRANSITION NOR CHANGE - THE CASE OF EARLY IRON AGE IN THE SOUTH BALTIC ZONE.

Author: Dr Slusarska, Katarzyna - Gdańsk University (Presenting author)
Keywords: Landscape-Archaeology, heterarchy, Pomerania
Presentation Preference: Oral

According to classical narratives the beginning of the Iron Age deepened social inequality and hierarchical structure among European societies. Though not in every region. Outside borderline of Mediterranean World and far from main routes the change seems not be so visible. Maybe it had not happened at all. One of such region on the periphery is Pomerania or in broad meaning South Baltic zone.
Early Iron Age did not bring any substantial change comparing to previous millennium - no central place had emerged here, no prestige goods were deposited in chieftain graves, and in fact there are not any princely graves. The only change is the change in burial rituals that brought to transition from burial mound over a grave to a flat, cist grave architecture, from single to collective graves and, most of all, the redefinition of a "proper" form of the container for human remains. Simple vase-shape are replaced by house or face urns, what can be perceived as a manifestation of change in global vision of the human condition and his posthumous fate.
Settlement pattern of that time seems to be scattered, and so the gravesites. The cemetery as such are replaced by loosely defined place for the dead that had been stretched along one plateau or valley edge for hundreds of meters. Though, quite indigent, collective, cist grave seems to be axis mundi of this societies, as a place that gathered kin or family members. But what is more interesting, it seems to be small family rather than extended one.
The paper discusses the potential of alternative model of Iron Age: based on small village societies, with kin relation prevailing over territorial structure.

09 CHARACTERISING 'COMMUNITIES' IN THE EARLY IRON AGE OF SOUTHERN BRITAIN

Author: Mr McOmish, David - Historic England (Presenting author)
Keywords: landscape, communities
Presentation Preference: Oral

It is clear that the landscapes of southern Britain underwent significant and wide-ranging change in the early 1st millennium cal BC. This is evident from the transformation witnessed in the range and scale of settlement form, as well as the widening geographical locus of activity. What was driving these transformations? A number of ideas have been put forward to explain them and, very often, these have a catastrophical or near-Malthusian feel. What is clear, however, is that wider, social, issues must also be factored in to the calculation. The shifts in how people adapted and used the landscape go hand-in-hand with a marked change in the material remains - principally pottery and metalwork – and present a picture of highly dynamic communities at this time.

10 HETERARCHICAL COMMUNITIES IN IRON AGE SCOTLAND

Author: Professor Armit, Ian - University of Bradford (Presenting author)
Keywords: Iron Age, Scotland
Presentation Preference: Oral

The Iron Age of south-east Scotland is characterised by densely-populated landscapes of hillforts and enclosures. Evidence from Broxmouth, the most completely excavated hillfort in Scotland, shows a continuous sequence of occupation over some 800 years, suggesting that many of these sites were long-lived and thus probably contemporary. Detailed analysis of the Broxmouth sequence, supported by Bayesian analysis of around 160 AMS radiocarbon dates, demonstrates the evolution of a community that lacks any overt indicators of hierarchisation or evidence for the presence of a social elite. Extrapolating from Broxmouth to the wider settlement landscape of south-east Scotland presents a picture of multiple autonomous communities, collaborating and/or competing over many centuries. In these essentially 'non-triangular' societies, autonomy at the level of the individual community was manifested through architecture and the construction/remodelling and maintenance of hillfort enclosures. Confidence in this interpretation is strengthened by the very different archaeological signatures of the Late Bronze Age and Roman Iron Age in the same area, which both demonstrate a classically hierarchical structure.

11 SEGMENTARY LANDSCAPES IN NORTHWEST IBERIA: A MODEL FOR A DECENTRALIZED AND NON-HIERARCHIZED IRON AGE

Author: Dr. Currás, Brais X. - Universidade de Coimbra-CEAACP (Presenting author)
Co-Author: Dr. Sastre, Inés - CSIC
Keywords: Landscape-Archaeology, Anthropological-Theory, Social-Theory
Presentation Preference: Oral

Here we present a model for explaining the social, political and territorial structure of the Iron Age communities of Northwest Iberia that overcomes conventional wisdom of an Iron Age marked by growing complexity and an evolution towards inequality which ends up consolidating hierarchies. The study of castro communities has been possible by further developing the theory behind the segmentary model. We have rejected the rigid principles of segmentary lineage required by British functionalism, and usually applied to acephalous kinship-based societies. As an alternative, we use an alternative inspired in the original concept developed by E. Durkheim, more open and flexible, and easily applied to a greater amount of diverse social formations.
This theoretical development has provided an analytical model to be verified in the record. By using geographical information systems, we have implemented a particular analysis of locational strategies as a form of evaluation or assessment of the applicability this model. By making this process automatic, we have been able to analyze great volumes of information, both intensively and extensively, both for the Lower Miño Valley in particular and, for comparative reasons, with the rest of the Iberian Northwest.

12 CONFUSING IRON AGES: COMMUNITIES OF THE MIDDLE DANUBE BETWEEN TRIBAL HIERARCHY AND HETERARCHY

Author: PhD, Assistant Proffessor Mihajlovic, Vladimir - University of Novi Sad, Faculty of Philosophy (Presenting author)
Keywords: Iron Age, heterarchy
Presentation Preference: Oral

The late Iron Age of the southern Pannonia and northern/central Balkans is for decades dominantly interpreted through concept of the Scordisci as Celtic tribe that settled and dominated the area from "Celtic invasion" until Roman Empire's conquest of the region. However, when questioned from theoretical position away from ethnodeterminism and

cultural-historical paradigm, this interpretative framework loses its alleged support in historical and archaeological evidence. What emerges is confusing picture of the world broken into network of settlement clusters of uncertain mutual relationships and interactions, which does not fit previously supposed hierarchical structure ruled by tribal warrior aristocracy.
On the other hand, although heterarchy is better suited for trying to understand the character of the communities in the area, it also leaves some important questions unanswered. For example, what was the role of precious objects accumulation and hoarding; how are we to explain coinage and its use; why were there some individuals whose interment, though not exclusively different, was still more elaborated then majority of others; what was the role of probable professionalization and economy specialization; how did the part played by warriors' influence these structures, etc. While I do stand on the position that the concept of heterarchy or segmentary societies provides overall fruitful insights, it is also worth considering the state of "in-betweenness" of some Iron Age societies. I argue it is important to acknowledge that the Iron Age communities might have functioned with combination and mixture of phenomena we nowadays classify as hierarchical or heterarchical, and no imagined pure-state socio-political condition is to be expected for multiple layers and directions of their relationalities. In general terms, I hope to open discussion on how to approach examples of confusing Iron Ages that do not match easily our clear-cut theoretical expectations.

13 A BIT OF ANARCHY IN THE IRON AGE: NEW PERSPECTIVES ON SOCIAL STRUCTURE IN THE DUTCH COASTAL AREA OF NORTH-HOLLAND.

Author: Dr kok, marjolijn - Bureau Archeologie en Toekomst (Presenting author)
Keywords: Anarchy, social-structure, Iron-Age
Presentation Preference: Oral

The lack of hierarchy in the coastal area has often been contributed to a lack of data. In this paper I want to propose that this lack of hierarchy may be explained by new theories. The area is characterized by single farmsteads, small ritual deposits, animal but no human burials and single human bone deposits.
The spread of the farmsteads in the landscape combined with their appearance indicates a community where people were highly self-sufficient but shared a common culture. The rituals they performed confirm this social structure. I want to suggest that the people consciously chose anarchy as an organizing principle. I will elaborate on the type of anarchy that seems the most appropriate to understand this social structure which endured for hundreds of years. Furthermore I will show that when thinking about the Iron Age local narratives may differ from the general view that is proposed for this period. This is done not in order to deny the existence of hierarchy in other parts of the Netherlands during the Iron Age but to create a more complex understanding of social structures within this period. The main narrative is often used to explain all of Iron Age society but when we look at a local level a more diverse picture may emerge, where specific traditions and other ways of living together may come to the fore. New social ideas about the past may make us rethink the way the present is organized. When some form of anarchy existed for several centuries it may open up perspectives for anarchy as a feasible way of social organization in the future.

14 IRON AGE RELIGIONS BEYOND WARRIOR IDEOLOGIES

Author: Mr. Santos, Alberto - Universidad de Zaragoza (Presenting author)
Keywords: Iron Age Religion
Presentation Preference: Oral

Warrior ideologies have been central in the construction of Iron Age Religions. Although it is true that in specific contexts these ideologies could have been operational, they cannot be considered as characteristic of the whole range of European Iron Age societies. Such a generalization owes much to the Celtic-idealization, of which the fighter and the combat are core elements. These approaches have resulted in the perpetuation of many stereotypes and anachronisms in the interpretation of Iron Age religions, by presupposing the existence of hierarchical societies connected with the recurrence of the warrior, even in instances in which the archeological record did not support such readings. Although in the last decade attempts have been made to propose other perspectives on religiosity of Iron Age societies, the centrality of the warrior still weighs on it. It is necessary to continue questioning the actual importance of the sphere of war in different Iron Age ideologies according to their context, as well as its specific relation with power, without giving for granted that it should correspond with a hierarchical formation.
The case of North-Western Iberian Peninsula during the Iron Age, also known as Castro Culture, can be useful for this purpose. Despite the fact that studies focused on its religion have tried to overemphasize the importance of the warrior, the archaeological record indicates that, until the contact of Castro communities with Rome, the combatant is almost invisible. I suggest that Castro religion intentionally minimizes the social importance of warrior-like violence and values, avoiding the apparition of strong inequalities and maintaining segmented societies. Thus, as a context traditionally regarded as problematic for not showing evidences of those elements considered as typical of Iron Age religions, Castro religion is actually helpful in questioning such presuppositions by showing religious interests beyond warrior ideologies.

15 SHARING THOUGHTS AND SHERDS. THE COGNITION BEHIND FUNERARY RITES IN NORTH-WESTERN EUROPE DURING THE LATER PREHISTORY (800 BC–200 AD)

Author: MA de Roest, Karla - University of Groningen (Presenting author)
Keywords: Society, Cognition, Burial
Presentation Preference: Oral

It is (still) commonly held that the dominant burial rite in the Dutch region during the later prehistory (800 BC–200 AD) consisted of cremation. These cremations were often deposited in simple pits, and, as a result of that, interpreted as a reflection of local societies that were largely egalitarian in nature. A few rich graves that were also found supposedly echo the presence of an interregional elite.

However, societal norms according to which burial rites were executed prove more complex than the 'simplistic' narrative shows. This paper questions this narrative by firstly, posing that this view is already challenged when burial-fields are studied in more detail. Secondly, although cremation was probably dominant, alternatives were employed on a notable scale. It appears that individual and situational characteristics were vital in decision-making, reflecting complex societal norms that led to a broad, however normative, range of options for disposal.

This paper explores alternative explanations for the observed variability from the stance that every situation required a reaction that goes beyond status or persona. This response universally takes the shape of a shared or distributed cognition, originating from both biological impulses (emotions) and cultural responses (e.g. taboos). Although

this ever-changing cognition is unique per group, it simultaneously has a common nominator that can be found cross-culturally, as is demonstrated by (modern) ethnographic examples and prehistoric case studies.

Traditionally, archaeologists have focussed on material culture, although graves are only the material remnants of a process that included many immaterial facets. Here, it is stated that studying elusive elements of funerary rites, e.g. performances, or (annual) remembrance celebrations, is as important to understand the interaction between members of society and their funerary choices.

16 SOCIAL FORMATIONS IN THE IBERIAN SYSTEM IN ANTIQUITY: CELTIBERIA BETWEEN THE IRON AGE AND ROMANIZATION

Author: Mr. Bonilla Santander, Oscar - Universidad de Zaragoza. Grupo URBS-IUCA (Presenting author)
Keywords: Archaeology Economy Landscape
Presentation Preference: Oral

The traditional view about the inhabitants of the Iberian System in the center of the Iberian Peninsula during the Iron Age posed a strongly hierarchical society linked to the presence of groups of Central European warriors who after successive migratory processes had settled in the Iberian Peninsula subjecting to the Population indigenous. This process generated a dual society of aristocratic Central European warriors who subjected a peasant mass of indigenous peoples with cultural traditions of the Bronze Age. These populations were identified with the Celtiberians of the classical Greek and Roman sources and studied from the perspective of the conqueror giving rise to a historiographic myth about these human groups. The progress of archaeological works since the 1980s and the revision of the material elements of the excavations of the nineteenth and early twentieth centuries have called into question the classical interpretations of social organization in the Iron Age of the Iberian System. The incorporation of studies of landscape archeology and the use of related disciplines such as historical sociology has dismantled this approach. In the present work we will present how through the analysis of the material register we can verify that the socio-political organization in the Iberian System in the Iron Age was fundamentally egalitarian and in which there were in the social classes. This process occurs as a mechanism of collective social response to the inequality models developed in the Iberian Peninsula. With the arrival of Carthage and Rome, the social bases of the egalitarian model will be destroyed and the development of city-states will have a high level of inequality linked to the development of the Mediterranean model of citizen-soldier in continuous interaction with the Roman Republic.

17 THE IRON AGE IN NORTHERN ENGLAND: HIERARCHIES AND HETERARCHIES IN UPLAND LANDSCAPES DURING THE 1ST MILLENNIUM BC IN NORTH-WESTERN ENGLAND

Author: Dr Hoaen, Andrew - University of Worcester
Co-Author: Dr Loney, Helen - University of Worcester (Presenting author)
Keywords: British Iron Age
Presentation Preference: Oral

Traditionally the British Iron Age has been interpreted on the basis of hillfort zones, such as Wessex, with high concentrations of population, evidence of intensification of agriculture, long distance trade and craft production. Socially and politically, these are regarded as highly hierarchical, potentially unstable societies. The emphasis on such large scale, centralized territories has detracted from understanding areas away from these zones.

Large parts of the United Kingdom exist outside of the hillfort zones and have less visible forms of competition and economic activity. Within these regions there is little evidence for production and consumption of prestige goods. Domestic materials such as pottery and metalwork are scarce and settlement evidence is abundant and consists of a widespread dispersed pattern of individual farmsteads and small villages. Such regions are often dismissed as peripheral, subsidiary or subordinate members to their better known neighbours.

This Iron Age seems alien to archaeologists familiar with building top-down models of society based around elite structures in prehistory. It asks for an approach based on a bottom-up model linking what is often a poor quality dataset across regions of both time and space. That this type of society is successful at maintaining itself against its neighbours is evidenced by their reluctance in engaging with outside influences in settlement form, whether in the Iron Age or the Roman period. This suggests a robust decentralized power-structure, focussing on upland economics, cooperation through sharing of resources, and with an economy based on stock rearing, extensive agricultural practices and physical circumscription affecting communication and transport.

We will explore how heterarchy, with an emphasis on balancing rather than controlling relationships, can help us to characterize territories which do not

conform to the top-down model of Late Iron Age social organization, but which demonstrably impact on the archaeological record.

18 HOUSE SOCIETIES IN ATLANTIC SCOTLAND

Author: Prof Sharples, Niall - Cardiff University (Presenting author)
Keywords: House Societies, brochs
Presentation Preference: Oral

In this lecture I will explore Levi-Strauss's concept of the 'House Society' and consider its application to the broch building societies of Atlantic Scotland. It will begin with an exploration of the deficiences in the definition of the term and illustrate these by the examination of some recent archaeological and anthropological applications of the concept. I will argue that a much more constrained use of the term is required that limits its application to a few unusual societies, as Levi Strauss had originally intended. The value of the term will be assessed by a consideration of the Iron Age societies of Atlantic Scotland where large stone built roundhouses dominate the archaeological record. A consideration of the nature of the House Society provides very helpful in undeerstanding the archaeology as reframes the arguments about status that have bedeviled recent debate.

19 SOCIAL DYNAMICS IN IBERIAN IRON AGE: BETWEEN INCLUSIVE AND EXCLUSIONARY STRATEGIES

Author: Dr Grau, Ignacio - University of Alicante (Presenting author)
Keywords: Iberia, heterarchies, hierarchies
Presentation Preference: Oral

Research carried out in the central region of Valencia has shown the development of social complexity, the emergence of urbanism, early states and economic development with interregional exchange during the 5th to 1st centuries BC. In that sense, the study area draws in other Iberian Iron age regions with similar social dynamics, although with less hierarchical social structures than in the southern Iberian societies. Traditionally, research has interpreted the organization of these societies as peoples in stages less developed in evolutionary narratives. However, alternative models of social organization have recently been proposed in which heterarchies or organization in Iberian factions play a key role. Following these proposals, in this presentation I use the dual-processual theory of Blanton and colleagues to analyze the social dynamics and the different historical trajectories of the study-area. I will pay special attention to the elements of archaeological record used to define exclusionary or corporative social strategies. In this proposal, hierarchies and heterarchies are interrelated, two structures that are not mutually exclusive but tend to concur in most social systems.

20 IRON AGE SOCIETIES AND KINSHIP THEORY

Author: Prof. Hingley, Richard - Dept. of Archaeology, University of Durham (Presenting author)
Keywords: kinship, kindred, leveller
Presentation Preference: Oral

This paper argues that the Iron Age societies of southern Britain may be interpreted through the anthropological conception of two apparently diametrically opposed forms of kinship. Rowlands (1980) suggested that Bronze Age societies may have been characterized by a patriarchal, patrilineal and patrilocal form of kingship comparable to 'Crow-Omaha system'. This was taken to suggest that Bronze Age households might have been highly solidary and competitive. Rowlands drew upon Barlau (1976) writing upon 'proto-European' kinship.
Kinship theory has gone rather into abeyance since the 1990s, but this paper will review Barlau's suggestion that such forms of kinship in 'proto-European' societies were gradually replaced by another form of kinship characterized by the creation of kindreds. Kindreds may often form in situations where land or resources are in fairly short supply as a means of creating a more co-operative and less competitive social system (e.g. Godelier 2011). This may create less of a tendency for individuals and descent groups to seek to accumulate increased wealth or greater numbers of followers than in a more competitive society with well-defined descent groups.
This kindred-based idea is offered as an alternative or supplement to other 'leveller' accounts of the Western European Iron Age. It is suggested that both these kinship tendencies may have been present to some degree within later prehistoric society in southern Britain, building on earlier research .

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070 BUILDING STRUCTURES, ACTIVITY AREAS AND SITE LAYOUTS OF NEOLITHIC SETTLEMENT AREAS

Theme: 6. Interpreting the archaeological record
Author: Ridky, Jaroslav (Czech Republic) - Institute of Archaeology of the CAS, Prague
Co-Author(s): Stäuble, Harald (Germany) - Landesamt für Archäologie Sachsen (Archaeological Heritage Office, Saxony)Ilett, Michael (France) - Université Paris 1 Panthéon-SorbonneHamon, Caroline (France) - CNRS, permanent researcher
Keywords: Neolithic, Settlements, Activities, Artefacts, Reconstructions
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

For archaeologists, the study of the arrangement of settlements represents one of the most important possibilities of gaining knowledge of past societies. The topic of our session therefore focuses on the issues of the original forms and layouts of settlement areas, including residential buildings, storage and production features, wells, or features with a presumed socio-ritual function. The study of the original form and position of all such features, together with the location of different activity areas (workshops, butchering places, etc.) may help us compare and understand various Neolithic societies in different parts of the world.
For the majority of dug-in features, it is difficult to determine their original form or primary function. Unfortunately, we do not even know much more about specific construction details of the most significant European Neolithic features – the longhouses and ditched enclosures, even though their study has been carried out for more than half a century. At the same time, we must take into account that there were many other structures in settlements which did not have to be dug into the soil. The existence of such structures, however, could be indicated by the presence of daub remains or by the position of grinding tools, sherd scatters, etc. The composition and structure of daub, together with imprints of the construction details in it provide important additional information about building structures. Papers or posters focused on worldwide Neolithic issues (spatial analyses, analyses of daub remains, reconstructions of structures) are welcome in our session.

01 SITE LAYOUTS OF NEOLITHIC SETTLEMENT AREAS – THE QUESTIONS

Author: Ilett, Michael - Université Paris 1 (Presenting author)
Keywords: Neolithic, settlements, layout
Presentation Preference: Oral

This introductory paper opens the session. It will address the main topics raised by new discoveries from all over Europe in relationship to the old and everlasting question of spatial organization. New approaches developed by excavation and recording techniques, by GIS or through closer cooperation with geomorphological sciences can provide a more precise view of the archaeological evidence. The search for associations of archaeological features at various spatial scales, ranging from house to complex site level, can contribute to understanding the way settlements were organized and how they functioned. Spatial analyses of different finds categories can help identify activities and activity

areas. A major challenge here is to distinguish recurrent patterns from the mass of single events. We need reproducible results before we can interpret site layouts in functional or cultural terms.

02 SACRALIZATION OF LIVING AREA AMONG NEOLITHIC HUNTERS AND FISHERS OF THE FOREST-STEPPE ZONE OF WESTERN SIBERIA

Author: Ms Skochina, Svetlana - Institute of the problems of Northern development, SB RAS (Presenting author)
Co-Author: Ms Enshin, Dmitri - Institute of the problems of Northern development, SB RAS
Keywords: Neolithic, Settlements, Artefacts,
Presentation Preference: Poster

A study of the Neolithic settlements of the Lake Mergen identified rituals associated with the process of preparation of a place for new housing, with construction and use of dwellings among ancient hunters and fishers. During construction of some of the dwellings of the Early Neolithic settlement of Mergen 6 (the end of the 7th millennium cal BC), a number of actions were carried out, which were connected with a rite of construction sacrifice: separate elements of the inner structure of the pit, the frame and the pillars, a zone at the entrance and at the fireplace were marked with intentionally placed objects. The main markers of area sacralization in the dwellings were ceramic vessels, bone tools, including ornamented ones, as well as horns and skulls of animals. In the course of use-wear analysis, it was found out that the tool kit is equally represented by both hunting and fishing equipment and such kinds of domestic production as pottery, weaving, etc.
The fact that one of the dwellings of the settlement of Mergen 6 has several single non-equipped burials reflects a large layer of rituals involving both the rite of construction sacrifice, the cult of ancestors, and beliefs about the structure of the world. It is more than likely that the ritual of burying people in the floor of a dwelling illustrates a process of mastering (in the sacred sense) a new living space.
Thus, the rite of construction sacrifice could reflect not only the sacred acts related to house-building, but also those related to the economy / industry. Such actions were associated not only with functions of preserving / guarding an occupied living space, but also, in part, they ensured the welfare of the group in a broader sense.

03 DRY LAND AND LAKESIDE SETTLEMENTS IN FOUR LAKES REGION IN AMINDEON BASIN (GREECE)

Author: Dr. Chrysostomou, Panikos - Florina Ephorate of Antiquities (Presenting author)
Keywords: Four Lakes Culture
Presentation Preference: Oral

The surveys and excavations of the last 15 years in Amindeon region conducted by Florina Ephorate of Antiquities, resulted in the discovery of several prehistoric dry land and lakeside settlements dated from the late 7th to the late 2nd mil. BC. From the preliminary approach of the excavational data so far yielded, the development of a unique culture in the region is documented, with an active contribution - especially during the earlier phases - to the neolithisation of Balkans.
The location of the settlements confirms the special relationship that local neolithic communities developed with wetland environment, an interaction sustained with an impressive adaptive ability throughout prehistory. Even though during Early and Middle Neolithic periods (mid of 7th - mid 6th mil. B.C.) some basic choices regarding the construction and organization of habitation's space refer to dry land occupation, the proximity of those settlements to the adjacent marshes necessitated the adaptation of building techniques similar to pile dwellings.
In late 6th mil. B.C. the occupation of the lakes' and marshes' shores is intensified, resulting the establishment of several lakeside settlements. The investigation of extended destruction layers, numerous structural elements and artifacts of various organic materials yielded new data to the prehistoric research of the region. The preliminary study of the evidence from the lowest waterlogged layers of Limnochori II, Anarghiri IXa and Ib refer to dwellings built on water or by the shores, with a wide range of construction techniques implemented.
All these evidence referring to the diachronic intra-settlement spatial organization, the form and internal arrangement of the houses, together with thousands of clay, stone and wooden tools, as well as artifacts and ornaments related to the ideological means of expression of the local prehistoric communities, formulate a unique data set for the research of pile dwellings in Southeastern Europe.

04 GHOST IN THE RUINS: THE ANALYSIS OF BUILDING REMAINS IN NEOLITHIC NORTHERN GREECE AND BEYOND.

Author: Dr Kloukinas, Dimitris - Ephorate of Antiquities of Euboea (Greece) (Presenting author)
Keywords: Neolithic building technology
Presentation Preference: Oral

During the last three decades, intensive fieldwork in the form of rescue or more systematic projects has considerably enriched the Neolithic record of northern Greece (ca. 6600/6500 – 3300/3200 cal BC). The remains of dwellings and associated features, often in the form of fire-hardened daub rubble, stand out as the most prominent features in the landscape. The architectural repertoire comprises a wide array of building types (including post-framed, above-ground structures and pit-dwellings) and techniques, thus offering the potential for a comprehensive regional analysis of house construction. Nevertheless, the analysis and interpretation of prehistoric building assemblages is not a straightforward process. The limitations posed refer not only to their preservation status or the excavation methodologies followed, but also to the lack of both a consistent analytical tool and an appropriate theoretical framework. On an interpretative level, a further issue has been successfully summarised by Wilk and Rathje (1982, 617) when arguing that as archaeologists "we must infer dwelling units from the material record; then we must infer households from the dwelling units".
This paper will address the various methodological and theoretical considerations accompanying the study of building technology and, especially, the analysis of burned superstructural material. The focus will be on Neolithic northern Greek assemblages. However, the considerations to be put forth are relevant to a wider spatiotemporal context.
Reference
Wilk, R.R., and W.L. Rathje 1982. Household archaeology. American Behavioral Scientist 25, 617–40.

05 NON-RESIDENTIAL WOODEN STRUCTURES IN THE NEOLITHIC LAKESIDE SETTLEMENT ANARGHIRI IXB (WESTERN MACEDONIA, GREECE)

Author: Giagkoulis, Tryfon - University of Bern, Institute of Archaeological Sciences (Presenting author)
Keywords: Wood, Trackways, Palisades,
Presentation Preference: Oral

The Rescue Excavations Project carried out by Florina Ephorate of Antiquities at the lignite-mining zone of Amindeon has brought up into discussion Neolithic architecture in Greek wetlands, since among the numerous finds and findings from several settlements at the shores of the region's four lakes, there are a great number of structural woods preserved in waterlogged deposits.
This paper focuses on Anarghiri IXb, a lakeside habitation that covered an area of 2.8 hectares, in the central part of which the anthropogenic layers are 4 m thick. The discovery and selective sampling of nearly 3.500 wooden structural elements (uprights, horizontal woods, planks) from the late 6th millennium BC lowest layers constitute a unique assemblage related to Greek Neolithic architecture. The systematic post-excavation documentation of this material is developing with the implementation of a methodology, which exploits wood species identification, categorization of structural woods and spatial analysis and aims to decode the settlement's pile field and to correlate clusters of wooden elements with specific structures.
The identification so far of three wooden trackways and parts of the settlement's enclosing works (palisades) offers the opportunity for a closer study of the organization and construction of space at the periphery of Anarghiri IXb, the correlation of these features to adjacent activity areas and their possible function(s) at the margins of the occupation's main residential space and beyond, within the prehistoric wetland. The documentation of different construction techniques implemented by the Neolithic builders represents a special case study, which enables the investigation of some unknown in Greek prehistoric research non-residential wooden structures. Moreover, there are certain potentials for a multidisciplinary approach of this material, including the examination of woodland management by the local neolithic communities, the reconstruction of the region's palaeoenvironment and the introduction of dendrochronology in Northern Greece, as well as in Southern Balkans.

06 LAYOUTS AND LANDSCAPES IN THE CENTRAL BALKANS: A COMPARATIVE STUDY OF TWO SETTLEMENT TYPES

Author: Penezić, Kristina - BioSense Institute,University of Novi Sad, Serbia; Centre for Digital Archaeology, Faculty of Philosophy, University of Belgrade (Presenting author)
Co-Author: Tripković, Boban - Department of Archaeology, Faculty of Philosophy, University of Belgrade
Keywords: Settlements, site layout
Presentation Preference: Oral

Late Neolithic/Early Eneolithic in the Central Balkan area is represented in almost one thousand settlements. We will be focusing on the comparison of two settlement types that bear similar visual characteristics. The site of Vinča - Belo brdo is a representative of tell sites. It is traditionally regarded as one of only couple of Vinča tells. Current investigations are showing that there is around 11 ha of the settlement still intact, whereas most of the tell is either eroded by the River Danube or excavated. Excavated parts of the settlement point to long-term occupation, densely packed houses, and expressive material culture. As a contrast, small settlements of Obrovac type are a common occurrence in western Serbia in Late Neolithic/Early Eneolithic times. Those are low mounds of up to 40 meters in diameter, usually surrounded by a ditch. Their stratigraphy points to short-term occupation of 1-2 households only. In this paper, we are observing these settlements in their specific landscapes and exploring their connection to the natural environment. Similarities and differences of the contemporaneous Late Neolithic/Early Eneolithic settlements, as well as their site layouts will be discussed.

07 FROM THE SHROUDING CLAY – MICROARCHAEOLOGY OF A CRIȘ-SETTLEMENT IN THE UPPER TISA REGION

Author: Dr Sommer, Ulrike - Institute of Archaeology, UCL (Presenting author)
Keywords: Taphonomy, soil-microbiology, Starcevo-Criș
Presentation Preference: Oral

Flat settlements of the early Neolithic Starcevo-Körös-Criș culture are badly known at the moment. In many excavations, only pits are recovered. Cultural layers overlaying postholes and pits are frequently encountered, but rarely investigated in any detail, with the exception of Ecsegfalva. Excavation areas are also often quite small. This makes it difficult to understand the settlement layout, let alone the range of activities connected to individual houses.
In order to understand the relation between houses, pits and finds in the cultural or occupation layer, we have started an excavation project at the Romanian Criș-site of Tășnad/Sere (Satu Mare country). The site is well known by rescue excavations, and the remains of at least 3 post-built houses have been uncovered. Most of the site is covered by a cultural layer that is between 30-50 cm thick.
In 2012, we started excavating a trench where the Neolithic sediment is covered by more than a meter of alluvial sediment. We are recording all find >1cm three-dimensionally, and also note orientation, dip and strike. That way, we can control for postdepositional disturbance like flooding and argiliturbation. Soil samples are taken on a 1m raster. In addition to ph, loss on ignition and resistivity, we also look at the distributions of trace elements and palaeobacteria.
Archaeobotanical macro-remains are quite rare, maybe due to the presence of collectively used spaces outside the settlement, so we now explore phytoliths as well.
Postholes are quite shallow, but linear features may indicate the presence of mud-walls. In addition to a wealth of taphonomic information, the site has demonstrated the huge potential for soil-biological studies. The big challenge will be to develop strategies for incorporating some of our analytic procedures into the excavation of larger areas under conditions of rescue archaeology.

08 THE APPLICATION OF 2D MORPHOMETRICS ON CERAMIC ASSEMBLAGES: AN EXAMPLE FROM EARLY NEOLITHIC SITES IN NORTHWEST ROMANIA

Author: Mr. Vindrola Padros, Bruno - University College London (Presenting author)
Keywords: morphometrics, potsherds, breakage
Presentation Preference: Oral

The present study is centred on the analysis of ceramic breakage and alteration approached through 2D morphometric computational techniques. Just like sediment particles, the size and shape of a fragment is altered under conditions of abrasion and breakage. While some of these conditions can occur by the intention of the human agent, most of them appear during or after deposition, which can include actions like trampling, transportation (by acquatic or non-acquatic means), bioturbation, and the ploughing of fields. It follows that the study of morphological changes in specimens can point towards the specific abrasive or breaking processes to which fragments were submitted. Through the use of shape descriptors in image analysis softwares the examination of these changes can be much more detailed, reproducible and quickly assessed, and for that it remains a popular approach in Earth Sciences. The aim of this study is to explore the use of image analysis for ceramic fragment morphometry, and how this methodology can help answer

questions of how people dealt with broken pottery in the past, as well as understand the post-depositional conditions of potsherd assemblages. For this reason, image analysis of ceramic materials from the Early Neolithic site of Tăşnad Sere (Satu Mare Province, Romania) and Călineşti-Oaş (Mara Mureş Province, Romania) is performed through ImageJ/Fiji and Matlab softwares, where both the dimensions and the shape description of fragments are estimated. The results obtained from the comparison of the assemblages from these sites is then presented, shedding light on trampling, ploughing and selective transportation processes affecting the assemblages. Lastly, the advantages and some precautions of the use of 2D morphometrics for studies of ceramic breakage and taphonomy are highlighted.

09 THE LOCATION AND IDENTIFICATION OF ACTIVITY AREAS AROUND LBK LONGHOUSES

Author: PhD student Połczyński, Łukasz - University of Gdańsk (Presenting author)
Co-Author: Ms Michalak, Katarzyna Inga - University of Gdańsk
Keywords: LBK, activity areas
Presentation Preference: Oral

This paper presents the results of research into activity areas around LBK longhouses recorded in southern Poland. The aim of the research was to check whether it is possible to isolate activity zones intended for routine daily household activities, and to determine whether any consistent and repeatable space use patterns could be detected.
Considering chronological relations between the houses, we analysed relations between features whose function is unambiguously associated with everyday household activities and the structure of refuse related to these features. In particular, the distribution of cereal remains in areas clearly evidencing the use of fire can be interpreted as locations associated with food storage and processing.
Another aspect of the study is to emphasize a possible limitation of recognition of the activity zones caused by then practices of refuse disposal, the long-term process of deposition and the overlapping of various activity zones that can be problematic during analysis of the domestic artefacts recorded at the multi-phase settlements.

10 EYTHRA AND ELSEWHERE. DIFFERENT BK-SETTLEMENT ORGANIZATION OR ALL THE SAME?

Author: Dr Staeuble, Harald - Archaeological Heritage Office (Presenting author)
Keywords: settlement find distribution
Presentation Preference: Oral

Many development-led large scale excavations were necessary in Saxony after 1990. This offered the possibility not only increase the amount of Bandkeramik (BK) settlements considerably, made it necessary to correct our knowledge on site distribution within the landscape in NW-Saxony. They also show different densities of occupation and an apparently different settlement layout. Often enough the number of features and houses do not correspond to the amount of artefacts found within them. This leads again to important questions about the interpretation of archaeological finds and their spatial distribution within pit structures and in the domestic areas around the houses. Beside usual examination of artefacts according to typological aspects, to their number and preservation, we do micromorphological analysis of thin-sections from pit fillings and geochemical analysis in order to find out activities which led to the sedimentation of the archaeological features.

11 A COMPLETE LBK-SETTLEMENT WITH MANY WELLS IN DROSSDORF, SOUTH OF LEIPZIG, SAXONY, GERMANY.

Author: Kretschmer, Saskia - Archaeological Heritage Office Saxony, Germany (Presenting author)
Keywords: LBK-settlement, 3D-documentation
Presentation Preference: Oral

Between 2011 and 2015 a Neolithic settlement area larger than 18 ha has been excavated on behalf of lignite mining. The LBK-settlement revealed more than 70 houses, seven different wooden well constructions and a huge number of pits. According to typo-chronological data the settlement must have existed between about 5300 and 5100 BC.
Still only few houses overlapped each other. Large areas of the site were covered by a light grey sediment containing many finds. Beneath typical LBK-structures showed up. This complicates the analysis of the site, but at the same time offers the opportunity to localize activity areas of the settlement. Some features were excavated in detail using a 3D-documentation of finds. Together with micromorphological and chemical analyses of the sediment we aim to reconstruct the genesis of different pit fillings and also their interpretation. Within and nearby the area other middle and late Neolithic features were found, so we can see different settlement layout and activities showing a different use of landscape in time.

12 UNIQUE WELL FROM UNIČOV AND NEOLITHIC SETTLEMENT AREA IN MORAVIA (CZECH REPUBLIC)

Author: Mgr., Ph.D. Kalabková, Pavlína - Palacký University Olomouc (Presenting author)
Keywords: Neolithic, well, settlement
Presentation Preference: Oral

Morava River basin is one of the traditional ancient settlement regions in Central Europe. The reasons for its favoured position include good environmental conditions suitable for sedentary agrarian way of life. The Morava River and Odra River connect North European plains with the Danube valley as an important natural communication corridor between the northern and southern parts of Central Europe. This ancient settlement region contains numerous documented Neolithic sites, and is defined by its river floodplains, centrally located highlands and the foothills that border the adjacent mountain ranges.
Evidence of sedentary occupation is known since the Neolithic (5500 – 4200/3800 BC) and it is associated with an agricultural way of life. Layouts of large longhouses built of timber were found here together with enclosures, storage pits, ovens, fragments of ceramic vessels, chipped and polished stone tools, bone and antler artefacts.
During late 2015, a new archaeological rescue excavation at the Uničov – U Kravína site exposed an LBK settlement area with 10 longhouses, hundreds of pits, remains of an oven and a wooden well, which is the most unique feature. The well is preliminarily dated dendrochronologically to the beginning of Neolithic, ca. 5278 – 5104 BC. The timber construction was very well preserved and the total volume of sediment infill from the well was precisely sampled and stored. Meanwhile it was possible to identify archaeological material in the well infill (such as pottery, stone and wooden artefacts) as well as environmental material (pollen, plant macroremains, charcoals, moss, molluscs, diatoms, ostracodes, animal bones and insects). Sediment samples for chemical analyses were also collected.

13 A PLACE TO BUILD YOUR HOUSE – INTERNAL SETTLEMENT STRUCTURES AND EXTERNAL BOUNDARIES AT THE LBK-SITE OF ARNOLDSWEILER-ELLEBACH

Author: Balkowski, Nadia - University of Cologne (Presenting author)
Keywords: LBK, settlement, house
Presentation Preference: Oral

The "Bandkeramik" (LBK) site of Arnoldsweiler-Ellebach (Rhineland, Germany) offers a great opportunity to study building structures and site layouts, since there is an exceptional combination of different features: A settlement with 50 houses, four wooden wells, a large cemetery, and an enclosure – also with houses in it – are documented.
In the proposed presentation, different aspects of this complex site will be analysed. Starting with an examination of the spatial and temporal development of the site, the different kinds of settlement structures are emphasised, and several characteristics like the alignment of houses in rows and clusters or house orientation will be discussed. In addition, the wooden water wells with their different constructions and positions in the settlement offer insights in the water supply and management of this LBK-settlement. In regard to the topic of water management, possible water supply features without wooden linings are discussed as well. Concerning the temporal development of this long-lasting settlement, the common reconstruction of continuously settled places will be challenged.
The presence of an enclosure with houses only 200 m apart from the settlement and a huge amount of surface finds in Arnoldsweiler raise the question of the general site layout and boundaries of a LBK-settlement. This aspect will be discussed in the second part of the presentation, focussing on the spatial arrangement of different settlements and on their possible connections or interactions.

14 NO RONDELS AROUND? SPATIAL ANALYSES AND SITE LAYOUTS OF SBK SETTLEMENTS

Author: Burgert, Pavel - Institute of Archaeology of the CAS, Prague
Co-Author: Dr. Ridky, Jaroslav - Institute of Archaeology of the CAS, Prague (Presenting author)
Keywords: Neolithic, Settlement, Rondels
Presentation Preference: Oral

The paper will present large-scale excavations with finds from the Bohemian area of the Czech Republic that date-back to the Stroked pottery culture period. These are defined as representing "normal" sites, on which no remains of any ditched structures have been confirmed. Based on the extensive area that has been excavated and the number of diverse structures and of other finds it was possible to compare the spatial arrangement of the houses, of the storage features and the other pits together with spatial analyses of the selected finds such as pottery fragments and lithics.
The paper will illustrate the change to the manner in which the varying structures are represented in the settlements and also the transformations that took place in their spatial location during the earlier phases of the settlement in SBK II-III and in the later stages that were categorised as representing SBK IV.
Also additionally discussed will be the issue of what does actually constitute the central function of some settlements in comparison with the "standard" sites, taking into account the recorded imports of raw materials, their frequency and the manner of their processing, together with the prevalence of certain specific types of structures, such as graves or ditched enclosures that are called rondels. The results presented here constitute the outcome of the grant project that was focused on settlement issues during the late Neolithic period (i.e. the 1st half of the 5th Millennium BC).

15 THE SITE LAYOUTS OF THE SBK SETTLEMENTS WITH RONDELS

Author: Dr Končelová, Markéta - Institute of Archaeology of the CAS, Prague (Presenting author)
Co-Author: Dr Květina, Petr - Institute of Archaeology of the CAS, Prague
Keywords: neolithic, settlement, rondel
Presentation Preference: Oral

The aim of this paper is to present the significantly different relationships, between the settlement structures that were revealed by the archaeological and spatial analyses that took place on the Kolín I Neolithic site (i.e. the 1st half of the 5th Millennium BC). The paper is based on a project that is focusing on Late Neolithic settlements, which is seeking to define the structural differences that exist between the sites with rondels and those without them. The presence of two such rondels in Kolín I also ranks this settlement amongst the primary group of settlements of this type. Although we are familiar with several dozen similar Late Neolithic sites with rondels in Central Europe, the conceptual relationship between space and time was addressed only in a few individual cases. Despite their monumentality the existing floor plans of the Neolithic longhouses located in Kolín, together with other additional settlement objects and the rondel site itself represent merely an imprint of the original societies. What is interesting therefore is how these components are differentiated when their archaeological features, including the ceramic and stone assemblages are compared.

16 THE LAYOUT OF LATE NEOLITHIC SETTLEMENT AREA IN PRAGUE – RUZYNĚ: EVIDENCE OF ARCHAEOLOGICAL FINDS AND STRUCTURES

Author: Ms. Blažková, Tereza - Charles University in Prague, Faculty of Arts (Presenting author)
Co-Author: Mr. Kuchařík, Milan - Labrys, o.p.s.
Keywords: Settlement, Neolithic, Enclosure
Presentation Preference: Oral

The polycultural site at Prague district Ruzyne revealed an extensive settlement area of the Stroked Pottery Culture. Besides the common settlement features the settlement area contained also a circular ditched enclosure. Thanks to the analysis of the archaeological findings (pottery sherds above all and 14C analysis) removed from different features can be tracked the development of the site in time. And also thanks to spatial analyzing of the findings and their concentrations we can reflect position of individual settlement features, together with the location of different activities.
The dislocation of such elements as production features, storages and lonhouses we can identify on the site. The settlement area in Prague-Ruzyně itself is exceptional mainly by three important findings: 1. The circular ditched enclosure 2. Settlement pits with findings of specific fragments of daub, revealing an unusual overground structure 3. A pit filled with human bones, mostly fragments of skulls. A longtime project deals with detailed analysis of the findings from the settlement to reveal its original layout and time contemporaneity a sequence of individual settlement features.
The study was supported by the Charles University Grant Agency (814216), Charles University, Faculty of Arts.

17 THE EVOLUTION OF NEOLITHIC HUMAN HABITATION IN THE MUREŞ VALLEY: THE CASE OF ŞOIMUŞ-LA AVICOLA (FERMA 2), ROMANIA

Author: Petcu, Răzvan - "Vasile Pârvan" Institute of Archaeology, Romanian Academy
Co-Author: Archaeologist Ştefan, Cristian-Eduard - "Vasile Pârvan" Institute of Archaeology, Romanian Academy (Presenting author); Dimache, Mădălina - Gumelniţa Civilization Museum, Oltenita
Keywords: neolithic, Transylvania, Turdaş
Presentation Preference: Oral

The construction of the A1 highway (Deva-Orăştie sector) led, in 2011, to a rescue excavation in the settlement of Şoimuş-La Avicola (Ferma 2), Hunedoara County, located between Şoimuş and Bălata villages, on the first terrace of Mureş river. The excavation was undertook by the 'Vasile Pârvan' Institute of Archaeology (Bucharest), the Museum of Dacian and Roman Civilization from Deva, and the National Museum of Romanian History (Bucharest). According to the field observations, a Neolithic settlement with two main habitation phases was located here. From the stratigraphic perspective, the first phase contains signs of human habitation in pit-huts, and the second phase is indicated by surface dwellings. The dwellings were identified in the form of pieces of daub scattered throughout the surface, fireplaces, fragments of clay floors with a substructure of river gravel, post holes and a very rich archaeological assemblage (ceramics, bones, lithic material). These two phases are separated by a leveling. Most of the Neolithic complexes are pits with different functions: for storage or for clay extraction, later on reused as domestic waste pits. Also, 12 enclosing structures were documented, a few of them with traces of poles indicating palisades or fences.
As a conclusion we can say that the site from Şoimuş was intensely inhabited during the Neolithic period by the people of the Turdaş tradition, which evolved in the first half of the Vth millennium BC. It have been discovered coarse and fine ceramics (166 complete pots and numerous other ceramic fragments), anthropomorphic and zoomorphic figurines, over 200 clay weights (complete or fragmentary), lithic items (flint and obsidian blades, grinders, 150 axes of polished stone), processed and unprocessed bones, miniature altars etc.

18 HOUSEHOLD PRACTICES AND SPATIAL ORGANIZATION AT A COPPER AGE TELL SETTLEMENT: PIETRELE, ROMANIA. EXCLUSIONARY VS. CORPORATE STRATEGIES IN CRAFTS PRODUCTION

Author: Karaucak, Mehmet - Deutsches Archäologisches Institut (Presenting author)
Keywords: Households, Inequality, Diversity
Presentation Preference: Oral

Varna cemetery, with its lavishly equipped burials, has stood for a long time at the center of debates regarding the social organization and inequality during the Copper Age (5th Millennium BC) in Southeastern Europe. A broad, almost universal model of social and economic inequality was extrapolated from Varna to the rest of the region, without much discussion on the regional diversity or the root causes and mechanisms that facilitated such differentiation within the society. Recent theoretical perspectives, however, underline that there are multiple pathways towards concentration of political power and increasing inequality. Corporate strategies on one end of the spectrum and exclusionary networks on the other, provide distinct trajectories for accumulation of power and wealth in hierarchical societies.

Excavations at the Copper Age tell site of Pietrele in Lower Danube have revealed a complex settlement structure with a large outer settlement area surrounding the tell. The results from Pietrele do not only show that the site was inhabited by a larger population than anticipated, but also indicate a well-defined spatial arrangement of certain practices and functions. The difference at the household level is marked by a variation of inventories, emphasizing hunting/fishing practice on one instance or weaving/textile production on another. Likewise, households in the outer settlement reflect a similar pattern of specialization. Most of the non-domestic activities, such as feasting or burials seem to have taken place in the outer settlement area. Overall, the recent results from Pietrele offer a good opportunity to survey the spatial organization of a Copper Age community and explore the networks which shaped the social and economic relations in the settlement.

19 BUILDINGS AND FEATURES INSIDE A CAUSEWAYED ENCLOSURE OF MIDDLE NEOLITHIC IN WEST-CENTRAL FRANCE: CHARMÉ, 'LE PEU' (CHARENTE)

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Keywords: Causewayed-enclosure, Buildings, Middle-Neolithic
Presentation Preference: Oral

Discovered in 2011 by aerial survey, the causewayed enclosure of 'Le Peu' at Charmé (Charente, France) covers an area of seven to eight hectares. It's composed of one outer ditch with two internal wooden palisade trenches, oriented NW/SE, cross the west area of calcareous headland which opened during the Neolithic on wetlands. The layout of ditches and features preserved inside the enclosure were been fine map during several campaigns of geophysical surveys between 2013 and 2016. The results of these surveys have been helped us to guide the excavated operations.
The aim of this communication is to present the features discovered during the four campaigns of excavated programme, between 2014 and 2017. Its contribute to document the filling of ditches, to characterise, for the first time in the region and for this period, earthen architecture and postholes of four buildings inside the enclosure. Its allow to identify also the preservation of soils and features close to the ancient banks of the wetland. The great conservation of features inside the enclosure (postholes, pits, heated stones layout, palisade trenches) and their originality give to this site an exceptional character in Western France. The artefact and the radiocarbon dates correspond to the beginning of the Middle Neolithic, in the middle of the fifth millennium BC. Particularly unknown in the West-Central France, this period constitutes the time of the erection of the first megaliths, other forms of Neolithic monumentality studied during a collective research project in which the excavation of Charmé is integrated.

20 LIVING IN THE SOUTH OF FRANCE AROUND 4000 BC

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Keywords: Chassey-culture Village Building
Presentation Preference: Oral

In southern France, for the Chassey culture, our knowledge of land use dynamics was until then mainly restricted to cave occupations, massive enclosures and, in alluvial plains only, large open-air sites without any compelling trace of habitat. For this period, the only known buildings were then unconvincing and scattered on the territory.

A recently excavated site in Vernègues (60 km north-west from Marseille) renews our knowledge with the discovery of a village composed of about fifteen buildings. These constructions demonstrate high-level architectural skills and reflect the advanced consideration given to their implantation during the two centuries of occupation of the site. Moreover, the analysis of the architectures reveals two main types of buildings: a dozen of standardized constructions seems to refer to domestic use and some impressive "special buildings" may evoke more collective purposes.

The living floors are not preserved, but the activities conducted on the site may be approached by the archaeological material found in dug-in features: postholes, pits, wells and in an area where heated-stone hearths are concentrated. The different kinds of remains (ceramic, flint and obsidian industries, grinding tools...) reveal several spatialized activity areas. Charcoal analysis gives clues about the management of the natural resources around the site. In particular, their examination reveals a selection of the fuel used in the heated-stone hearths, with a respect for this choice over time.

During the Chassey period, the Vernègues site is integrated in a large-scale distribution network as evidenced by the discovery of numerous obsidian artefacts and of a copper awl. These objects refer respectively to Sardinian and Italian origins. The organization of this village could result from this integration in a supra-regional network of influences and cultural interactions. It is indeed tempting to make comparisons between Vernègues and villages of contemporary cultures from Central Europe.

21 THE CATEGORIZATION OF EARLY NEOLITHIC PLACES – HERRESTORP, SOUTHERN SWEDEN, AS AN ILLUSTRATIVE EXAMPLE

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Keywords: settlement, place-categories, spatial-analysis
Presentation Preference: Oral

This paper discusses the interpretation and categorization of places with Early Neolithic (in Sweden 4000-3500 BC) activities. As a case study, a settlement at Herrestorp, dated to the early part of the Early Neolithic in southern Sweden is discussed.
The Herrestorp remains can be categorized as a settlement. Huts tell us someone lived here, and the finds testify to food preparation and consumption, production as well as ritual activities. However, interpreting this place as a settlement may be misleading as some of the complexity in the use of the place may get lost. The settlement category must be nuanced and problematized. It may be evident that a settlement was much more than a place where people lived. But archaeologically the settlement category can be treated somewhat one-dimensionally which leads to a risk of homogenizing a varied material. This is connected to how we regard the Neolithic landscape, our place categories and the tradition to study settlements and burials (and ritual places) separately. Moreover, a settlement and the people living there are often reduced to an uncomplicated entity and their relations to static association to "others". The possibility of fluctuating and varying groupings of people using various places in the landscape in various ways at various times has to be taken into account.
Analyses of pottery show how the pots at Herrestorp were made and later deposited into different pits and other structures. Moreover, analyses of burned clay have shown important results about the organization of the settlement. We highlight the complexity of the remains of Herrestorp, used by two groups, in two spatial extents, during different times, in order to discuss interpretations of the use of the place and the social organization within the settlement and beyond. This way we wish to bring nuance to the term settlement.

22 SPATIAL ORGANISATION OF A LATE NEOLITHIC ENCLOSURE SYSTEM AT PONT-SUR-SEINE (CHAMPAGNE, FRANCE)

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Keywords: Neolithic enclosure, Champagne
Presentation Preference: Oral

Since 2009, preventive excavations have revealed a complex of enclosures of 4th millennium BC date in the Seine valley, at Pont-sur-Seine (Champagne). Archaeological surveillance of gravel quarrying has provided the opportunity to observe this late Neolithic occupation over vast areas. The site has been excavated over 20 ha, but the total surface area can be estimated at around 40 ha.
The rarity of archaeological finds hinders our understanding of activities taking place within this complex. Nevertheless, the form and position of buildings, their varying density and the different palissade systems enable us to formulate some hypotheses about the general organisation of the complex. This site sheds new light on late Neolithic societies in the Paris basin that were previously only known from burial monuments.

23 ORGANISATION AND SPECIALISATION - ACTIVITY AREAS IN NEOLITHIC SETTLEMENTS IN THE WESTERN BALTIC REGION

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Keywords: Activity Areas, Settlements
Presentation Preference: Oral

Neolithic Settlement areas in the Western Baltic Region are characterised by different types of organisation like isolated farms, villages or fortified settlements. In addition, there are specialised sites, for example, workshops for the processing of flint tools. Based on several large-scale excavations of settlements in the last 10 years, current field activities and the evaluation of older excavations in the province Schleswig-Holstein in Northern Germany, it becomes possible to distinguish different areas in various Neolithic settlements. This includes residential buildings, storage features or wells. About the distribution of finds, various activity areas like workplaces or areas for subsistence and storage can be reconstructed - flint artefacts, botanical macro-remains or animal bones, for example. Activities like food processing, fishing, hunting, tool production, water supply or

habitation are visible too. In conclusion, there is the possibility to reconstruct the inner structure of settlements and, with that, models of social organisation in Neolithic societies. Consequently, the paper focuses on the identification of different forms of activities and activity areas in settlements, and questions of specialisation and social organisation of Neolithic settlements in the Western Baltic Region between 4100 and 1800 BC.

24 SIGNIFICANCE OF CAUSEWAYED ENCLOSURES IN THE STRUCTURE OF THE LATE NEOLITHIC SETTLEMENT AREAS: RESULT OF NEW RESEARCHES IN BOHEMIA

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Keywords: enclosures, Neolithic, Bohemia
Presentation Preference: Oral

Causewayed enclosures are quite common part of Neolithic settlement areas. In the Czech Republic they are known mainly roundels of the Stroked pottery culture. After this period we can see absence of this type of features and it appears again in the Late Neolithic, in the Michelsberg and Funnel Beaker culture. Creation of enclosures played an important role in the formation of religion and social organisation of the early European Neolithic farmers. In archaeological record they are represented by system of single or multiple trenches interrupted by multiple entrances.
In our paper, we present new researches of the Late Neolithic enclosures in the Czech Republic that have been carried out over the last three years. It seems that great causewayed enclosures have been common in the Czech Neolithic landscape at least since the Jordanow culture, and that might functionally followed the previous roundels.
Based on the new researches is discussed construction, way of building of these enclosures and its destruction. We will focus on the role of enclosures within the Late Neolithic settlement structure. It seems that the enclosures served as ritual areas, which played a role in the burial rite, but also in the management of herds of cattle.

25 INHABITING THE SOUTHERN PARIS BASIN IN THE LATE NEOLITHIC: GEOARCHAEOLOGICAL CONTRIBUTION TO RECONSTRUCT THE ARRANGEMENT OF SETTLEMENTS

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Keywords: Neolithic, Floor, Micromorphology
Presentation Preference: Oral

In inhabited contexts of the late Neolithic in Southern Paris basin, the characterisation of the architecture and of the activity areas distribution is a still debated complex question. Few years ago, domestic sites were only known by a few excavated sites. Nevertheless, very thin and massive anthropogenic layers were regularly discovered. These layers contained materials (potsherds and lithic fragments – flint, grindstones) in more or less thick concentrations. They are located in different topographic positions: plateau, slope, bottom of valley. For a long time, they have been judged as disturbed layers due to posterior erosion or modern ploughing. But current geoarchaeological research based on soil micromorphology lead to the identification of formation processes of these anthropogenic layers, using spatial samplings. A sampling at different points inside and outside the concentration of artefacts was made in order to record the variations in the sedimentary record. The micromorphological analysis applied to several sites in different geomorphological and pedological contexts, demonstrate that these layers are real preserved floors. Moreover, they reflect different uses of space which records several activity areas. The materiality of spaces reflected by the organisation of these floors, contributes to renew greatly the knowledge of the construction and the function of the inhabited area.
The aim of this paper is to propose, through different case studies, a first descriptive pattern of the formation processes of neolithic floors. It illustrates the difference of floor functions between interior earthen architecture and courtyards, and helps characterise the settlement pattern.

26 THE LATE NEOLITHIC SETTLEMENT OF LA CAPOULIÈRE (SOUTHERN FRANCE): SPATIAL ORGANIZATION AND HUMAN ACTIVITIES.

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Keywords: neolithic eathenbuilding ditches
Presentation Preference: Oral

The late Neolithic settlement of La Capoulière (Hérault, France) is a reference-site for the characterization of the human occupation of the alluvial coastal plains in Occitanie (Southern France, Languedoc) during the second third of the III millennium cal BC (Fontbouisse culture). The site was excavated between 2000 and 2008 using preventive archaeology techniques. The settlement is located on a coastal interfluve zone. Geoarchaeological observations show that the occupation starts with a leveling of the substratum. Most of the occupation surfaces of this village are still eroded by the modern ploughing processes, but a large network of ditches and pits was recognized. The settlement occupies a surface of around 7 hectares and seems the result of a gradual expansion of the village, organized in different compounds delimited by ditches (wide or narrow, and varying depths). The analysis of the infilling processes of the ditches could furnish relevant data about the evolution and the spatial organization of the Neolithic occupation and the activities performed both inside and outside the ditches. Ditches are partially filled by waste in provenance from close household activities or natural processes. However they show earth built spaces within them, especially in the last phases of their life. One of the relevant issues of the La Capoulière excavation is the identification of several earthen buildings that show a large use of this raw material for construction activities. These spaces were accurately investigated to recognize the construction techniques and to examine in depth the possible use of these areas. All these data complete our knowledge of the final stages of the Neolithic in Languedoc, where most of the past archaeological inquiries focused on the backcountry of the region, where numerous dry-stone villages are largely known.

27 TRACES EN NÉGATIF ET ARCHITECTURE DE L'ÂGE DU BRONZE ANCIEN EN CAMPANIE

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Keywords: EarlyBronzeAge, Eruption, Architecture
Presentation Preference: Poster

La fouille très fine d'un secteur de village du Bronze ancien final à Nola-Croce del Papa (Naples-Campanie) a permis de connaitre dans les moindres détails l'architecture d'un groupe de maisons sur poteaux plantés et avec "chevrons au sol". Cela a été rendu possible par la concomitance des phénomènes (pluie de ponces, de cendres, coulée pyroclastique, surge et lahar) qui ont caractérisé l'éruption des "Ponces d'Avellino" (3550+50 BP) dans le secteur de Nola. Ces produits pyroclastiques du volcan Somma-Vésuve ont

réalisé un moulage naturel fidèle de la construction des maisons. Le recouvrement des enclos et d'autres structures liées à l'élevage et au battage des céréales par les ponces a restitué la topographie du village, tandis que les céramiques, les vanneries, les squelettes des animaux abandonnés au départ des habitants, les restes de végétaux fossilisés par les coulées pyroclastiques qui, à la fin de l'éruption, ont pénétré dans les maisons, illustrent divers aspects de la vie quotidienne.
Sur la base de ces traces en négatif, les Auteurs décrivent les techniques utilisées pour l'édification des maisons et l'aménagement intérieur et comparent ce type de construction à d'autres habitations dans des sites contemporains (Gricignano, Afragola), mais aussi antérieurs (Oliva Torricella/Salerne) ou postérieurs (Ariano Irpino, San Paolo Belsito) à celui de Nola. Ils examinent d'autres contextes qui ont restitué des maisons dont le plan, est similaire («en fer à cheval») aux constructions campaniennes (Posta Rivolta-Pouilles).

28 THE OLDEST PHASE OF THE LINEAR POTTERY CULTURE IN THE LESSER POLAND (5600/5500-5300BC) - GENESIS, DATING, SETTLEMENT, ECONOMY.

Author: Prof Czekaj-Zastwany, Agnieszka - Institute of Archaeology and Ethnology, Polish Academy of Sciences (Presenting author)
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Keywords: Linear Pottery Culture
Presentation Preference: Poster

Beginnings of the Linear Pottery culture settlement in the Lesser Poland region are identical to neolithisation process of this area. This was a very important turning point, not only for the prehistory of that region, but for the whole of Central Europe. Areas of the Upper Vistula River basin played very important role, because there were within the first stage of LBK expansion. The oldest stage of cultural development is poorly known. Test trenches made so far in Gwoździec indicate that we are there to deal with the oldest phase of this culture, not disturbed by younger settlements, and radiocarbon dating made so far suggest that this may be one of the oldest sites of this culture in Poland. Systematic examination of the settlement on a large scale will form the basis for the characterization of the oldest chronological phases of LBK not only in the Lesser Poland region, but will also contribute to a significant increase knowledge about this episode of Early Neolithic in Central Europe.

The project focusing on the earliest phase of LBK settlement in Lesser Poland is currently realized (National Science Centre, Poland, NCN 2014/15/B/HS3/02460). It will require analyses of settlement distribution, obtaining new evidences on inner-structures and functions of domestic sites, and examining economical issues, analyses of artifacts, absolute chronology, and anthropological data. All these procedures should create the basis for reconstructing processes accompanying the settlement of the first farmers, including the question of their origin and their inter-regional contacts, and also chronological frames of the early phase of LBK in Lesser Poland, in correlation with the neighboring territories (occupied by other LBK groups and groups of the East Linear circle).

075 THE 'LONG' 16TH CENTURY: ARCHAEOLOGICAL EVIDENCE FOR INNOVATIONS IN THE RURAL WORLD (TECHNOLOGY, AGRICULTURE AND HUSBANDRY)

Theme: 6. Interpreting the archaeological record
Author: Grau Sologestoa, Idoia (Spain) - University of the Basque Country
Co-Author(s): Albarella, Umberto (United Kingdom) - University of Sheffield
Keywords: medieval, modern, agriculture, husbandry, technology
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

MERC
Medieval Europe Research Community

During the 16th century, Europe shifted from being 'medieval' to being 'modern' because some crucial changes occurred in all aspects of life. Abundant documentary evidence has allowed historians to investigate some of these changes, such as the exploration of other continents, the opening of oceanic trade routes, the remarkable development of politics, science, philosophy, international law and art, and the Protestant Reformation.
However, changes also occurred in the rural world, and, arguably, affected the character of human societies even more profoundly than the political and religious upheavals. In the period between the Black Death (14th century) and the Agricultural Revolution (18th century), unquestionably the countryside of Europe was transformed in both its appearance and practices.
This session will analyse changes that occurred in the 16th century, as this is the time following the end of the Middle Ages, but earlier than the Agricultural Revolution as traditionally defined. Can we see the roots of rural world transformations already in the 16th century, or was this a time still more closely connected to medieval practices?
We aim to bring together researchers from a variety of disciplines (zooarchaeology, archaeobotany, geoarchaeology, landscape archaeology, material culture studies, etc.) to investigate the nature of agricultural innovations that occurred in the rural world during the 'long' 16th century. This may include improvements in agriculture and animal husbandry, the introduction of new plant and animal species, and technological changes in the countryside. Although the session will focus on the archaeological evidence, the contribution of historians is most welcome.

01 AN INTRODUCTION TO "THE 'LONG' 16TH CENTURY: ARCHAEOLOGICAL EVIDENCE FOR INNOVATIONS IN THE RURAL WORLD (TECHNOLOGY, AGRICULTURE AND HUSBANDRY)"

Author: Dr Albarella, Umberto - University of Sheffield (Presenting author)
Co-Author: Dr Grau-Sologestoa, Idoia - University of the Basque Country; University of Sheffield
Keywords: postmedieval, agriculture, innovations
Presentation Preference: Oral

In this paper we will present the reasons behind our decision to organise the session. We will, in particular, want to discuss why we consider the 16th century a key period for the archaeological investigation of the rural world, and why this has been somewhat neglected. A fascinating aspect of archaeological research is to explore the dynamics that led to the creation of the modern world and this session intends to contribute to such endeavour. Though organised by zooarchaeologists, it aims to tackle the evolution of farming systems in the 16th century from an interdisciplinary viewpoint. We regard this as important, as changes did not affect just one aspect of agricultural life – e.g. livestock, crops, technologies - but were inevitably interconnected. The key question that this session will want to address is the extent to what the Europe of the 16th century was more rooted in the Middle Ages, or rather already fully involved in the Agricultural Revolution that will transform the countryside in the kind of landscape we are familiar with today. Inevitably the answer to this question will not be straightforward and will have to take into account the environmental and social complexity and diversity of different regions. It will, however, still be important to investigate the degree to which the 16th century can be regarded, in agricultural terms, as 'innovative' and ultimately 'modern'.

02 IMPACT OF SUBSISTENCE ON MEDIEVAL AND EARLY MODERN HISTORY LAND USE IN THE BOHEMIAN-MORAVIAN HIGHLANDS

Author: Mr Zaza, Petr - Masaryk University
Co-Author: Ms Mazackova, Jana - Masaryk University (Presenting author)
Keywords: subsistence landscape settlement
Presentation Preference: Oral

The studied region is being transformed substantially from the Middle Ages which grants unique possibilities of studying human impact on landscape formation. The aim is the identification of agricultural hinterland in relation to the settlement pattern and mining areas and, to reconstruct subsistence strategy of the studied region during the Middle Ages and Early Modern Period. The studied area is analyzed by the defined anthropogenic features in the landscape, using aerial archaeology and other non-destructive archaeological methods, as well as, the written sources from 13th to 16th century, where the main source is the Urbary of the Brtnice domain. These steps allow to create and test the model of land-use and subsistence strategies during the Middle Ages and Early Modern Period.

03 CHANGES IN RURAL SETTLEMENT AND LAND-USE ON ESTATES IN SOUTH BOHEMIA DURING THE 16TH CENTURY

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Keywords: landscape archaeology, estates
Presentation Preference: Oral

The contribution will focus on changes in rural settlement and land-use of the historic landscape at the end of the Late Middle Ages and the beginning of the Early Modern period in South Bohemia (region in the Czech Republic). In the context of the structural socio-economic change in the rural world at the turn of the 15th-16th centuries, previously in historiography traditionally associated with the concept of "agrarian crisis" or "crisis of the Late Medieval Period", there is evidence for the reduction and restructuring of rural settlements, but there were also qualitative changes and innovations in the husbandry practices and land-use. These processes of settlement transformation and changes in the land-use and husbandry have been well documented on several estates in possession of the great landowners in South Bohemia, where in the early 16th century the foundations for patrimonial estates were laid, based on the system of farming and husbandry in manorial farms. Other pillars of the estate management in the era of economic "boom" in the 16th century were founded on building fish pond systems and pastoral farming of sheep. Other significant evidence for non-agrarian use of landscape were the enclosures of land (defining boundaries) for newly established deer-parks with residences and gardens nearby, according to Italian-Renaissance style. Aristocratic patrimonial estates competed with town estates in the struggle for controlling local markets. Individual preserved patterns of former land-use and estate management, that were developed during the long 16th century, have been deciphered and interpreted using methods of landscape archaeology and other sources.

04 RECONSTRUCTING CHANGES IN RURAL SETTLEMENT AND LANDUSE BEFORE AND AFTER THE LONG 16TH CENTURY.

Author: Professor Lewis, Carenza - University of Lincoln (Presenting author)
Keywords: Testpit, rural, settlement
Presentation Preference: Oral

In the UK, the 16th century is a significant watershed which marked the beginning of the end of a period of sustained demographic stagnation which kept population levels low for centuries after the catastrophic collapse of the 14th century reduced medieval populations by nearly 50%. Recent research has shown how test pit excavation can reconstruct the scale and disposition of the 14th century collapse (Lewis 2016), and hinted at its potential for other periods (Lewis 2014), accordingly this paper will use the same approach to explore changes in settlement and land-use in the 16th century. This period saw the appearance of distinctive new ceramic wares in settlements of all sizes across the country: glazed red-wares were widely used from the 16th century onwards and exhibit a high degree of post-depositional durability, thus their recovery during field-walking or excavation can be used to infer the presence of contemporary activity such as habitation or manuring, and compared with earlier and later periods to establish whether the 16th century more closely mirrors medieval or early modern circumstances. This paper will review the results of the excavation of more than 2,000 1m square archaeological 'test pits' in 60 rural settlements in eastern England, which are allowing changes in the pattern of settlement and land-use to be reconstructed, and consider what they can reveal about the impact of the 16th century.

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Lewis, C. 2014 'The Power of Pits: Archaeology, outreach and research in living landscapes' in K. Boyle, R. Rabett and C. Hunt (eds) Living in the Landscape. Cambridge, McDonald Institute for Archaeological Research Monograph. pp 321-338.

05 LANDSCAPE AND SETTLEMENT EVOLUTION DURING THE 16TH CENTURY : MULTIDISCIPLINARY STUDY OF TWO MOUNTAIN AREAS

Author: Mr Chevassu, Valentin - MSHE Ledoux / Universite de Bourgogne-Franche-Comte (Presenting author)
Keywords: mountain, paleoenvironment, archaeology
Presentation Preference: Oral

Morvan and Jura are two medium mountain areas located in Eastern France. Both regions are documented by a large collection of medieval and modern archives, numerous paleoenvironmental analyses, recent archaeological LiDAR and field surveys. A systematic crossing between these different approaches has been done thanks to a database linked to a Geographical Information System. It enables us to describe quite accurately landscape and settlement evolution for the medieval and the modern periods: the Late Middle Ages and the early modern period are particularly well documented and many changes may be highlighted.
We will firstly notice the creation of numerous pre-industrial sites (especially production of iron and glass) in both mountain areas during the 16th century. Secondly, these areas also seem to be more involved in commercial relationships with the surrounding cities and plains: massive exportations of firewood are beginning in Morvan, while summer grazing is developing in Jura mountains. The increase of both industrial and agropastoral activities have therefore great consequences on the landscape. The overexploitation of forests is documented by palynological evidence while the first conflicts caused by the lack of wood appear in the archives. Thirdly, texts and archaeological surveys enable to follow the multiple creations of new hamlets inside the medieval settlement network. The 16th century appears therefore to be a turning point in the evolution of land-use in Eastern France mountain areas, now intensely exploited, and the origin of a new landscape that only disappeared with the 20th century reforestation.

06 'GREAT BREAK' IN RURAL TEXTILE CRAFT IN THE END OF THE 16TH CENTURY (ESTONIAN EXAMPLE)

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Keywords: weaving, textiles
Presentation Preference: Oral

On the basis of archaeological textile finds it seems that in the Estonian region fabric production in the countryside was firmly based on ancient working practices throughout the entire Middle Ages (ca. 1225-1583 AD in Estonian context). Weaving in medieval villages was probably a domestic handicraft mainly carried out by women. The tools and techniques known already from Prehistory (e.g. wool combs, spindle whorls, and vertical looms) were used. Something started to change at the very end of the 16th century. I have associated this change with the spread of new tools and technological knowledge in rural areas (for example, horizontal loom, spinning wheel and carding). The transition to newer tools was not a sudden break, but it seems that it had ended by the beginning of the 18th century. The roots for these changes are present in the 16th century with the Reformation, the devastating Livonian War (1558–1583), and the establishment of new political and economic systems in medieval Livonia that caused breaks in the mental and social sphere of society. One of the reasons for change might have been the greater influence of manor handicraft in villages, since craftsmen, including weavers, who worked only in manors, are known from the 17th century. Maybe also the developments in education caused greater openness of society that resulted in the spread of new knowledge and ideas.

07 INNOVATION: TURN SOMETHING OLD INTO SOMETHING NEW. <I>VICIA FABA</I> VAR. <I>MAJOR</I>.

Author: Nicolì, Marco - University of Salento; Laboratory of Archaeobotany and Palaeoecology
Co-Author: D'Aquino, Silvia - University of Salento; Laboratory of Archaeobotany and Palaeoecology (Presenting author); Dr Primavera, Milena - University of Salento; Laboratory of Archaeobotany and Palaeoecology; Dr Grasso, Anna Maria - University of Salento; Laboratory of Archaeobotany and Palaeoecology; Prof Fiorentino, Girolamo - University of Salento; Laboratory of Archaeobotany and Palaeoecology
Keywords: agriculture, faba, variety
Presentation Preference: Oral

The 16th century was a period of fundamental changes and transformations that revolutionized many aspects of life. Several innovations were also made in different areas, including agriculture: the Age of Exploration was already started and new plants were introduced from new continents to the Old World. But were these innovations exclusively linked with the new species or were they also connected to a process of finding better solutions on "old" species to fulfill new needs? This paper discusses the results of an archaeobotanical study carried out on three medieval sites in southern Italy, focused on faba bean charred remains that have been investigated through biometrical analysis. Data collected show a gradual increase in cotyledons size and allow us to speculate about a possible transition period (12th cent. - 16th cent.) in which a selection from a smaller, ancient faba bean (Vicia faba var. minor) to the bigger, more recent one (Vicia faba var. major), started. This process may indicates that not only new plants were introduced during the 16th century but also that ancient species (faba bean) were subjected to new cultivar selection.

08 IMPROVEMENTS IN ANIMAL HUSBANDRY DURING THE 'LONG' 16TH CENTURY IN ENGLAND: THE ZOOARCHAEOLOGICAL EVIDENCE

Author: Dr Grau-Sologestoa, Idoia - University of the Basque Country; University of Sheffield (Presenting author)
Co-Author: Dr Albarella, Umberto - University of Sheffield
Keywords: farming, Modern, revolution
Presentation Preference: Oral

Although many historians have extensively discussed the agricultural history of England between the Late Middle Ages and the Modern Era, this period of crucial changes has received less attention by archaeologists. In this paper, zooarchaeological evidence dated between the Late Middle Ages and the Early Modern period is analysed to investigate evidence for improvements in animal husbandry during the 'long' 16th century. The size and shape of the main domestic animals (cattle, sheep, pig and chicken) is explored through biometrical data and integrated with evidence of taxonomic frequencies, ageing and sex ratios. Data from 12 sites with relevant chronologies and located in different areas of the country are considered. The results show that, although a remarkable size increase of animals occurred in England throughout the Post-Medieval period, much of this improvement occurred as early as the 16th century. The nature and causes of such improvement are discussed, with the aim to understand the development of Early Modern farming and the foundations of the so-called Agricultural Revolution.

09 LIVESTOCK AND LANDSCAPE: LIVESTOCK IMPROVEMENT AND LANDSCAPE ENCLOSURE IN LATE AND POST-MEDIEVAL ENGLAND

Author: Fraser, Tamsyn - University of Sheffield (Presenting author)
Keywords: Zooarchaeology, Landscape, Improvement
Presentation Preference: Oral

The process of livestock improvement in England is documented both historically and zooarchaeologically, occurring as early as the 13th century and continuing until the modern era. It is often associated with the contentious notion of the 'Agricultural Revolution', which is poorly understood in terms of timing, nature, and cause. Recent consensus suggests that key agricultural developments occurred in the later medieval period, with zooarchaeological studies identifying corresponding alterations to animal size, shape and age patterns. Another feature often associated with the 'Agricultural Revolution' is landscape organisation. Much enclosure occurred
through agreement or piecemeal amalgamation during the late medieval period, which suggests that changes in land organisation may have contributed to the livestock change of this time.
Historians propose several ways that land enclosure may have contributed to animal husbandry
improvement, for example greater control over food, breeding and disease. However, there has been little direct association attempted between landscape change and livestock improvement for specific case studies. Furthermore, zooarchaeological assessment has previously focused on urban areas, where the geographical origin of livestock is uncertain. This study gives a more accurate insight into changing local husbandry strategies at their source by examining zooarchaeological material from three rural sites across England. The evidence of livestock size change from these case studies is compared to land organization from the immediate area, using the local historical record and landscape archaeology to investigate the scale and timing of enclosure. Evidently landscape
change occurred in a varied manner across England; therefore, case studies have been selected from areas with markedly differing enclosure mechanisms to assess how this affected livestock change and how advancements proliferated across the country. Overall, this provides a more detailed comprehension of the mechanism and timing of agricultural advancement, and therefore a better understanding of the development of English agriculture, husbandry and economy.

10 HORSES FOR COURSES: ARCHAEOLOGICAL EVIDENCE FOR THE DIRECTED BREEDING OF HORSES IN 16TH-CENTURY LONDON

Author: Dr Thomas, Richard - University of Leicester (Presenting author)
Co-Author: Dr Holmes, Matilda - University of Leicester; Dr Morris, James - University of Central Lancashire
Keywords: Horses, zooarchaeology, breeding
Presentation Preference: Oral

We present the analysis of almost 200 horse bone measurements from 38 sites excavated across the city of London, dating to the period AD 1220-1900. Using a combination of withers heights calculations and log-scaled measurements, we identify three main phases of size change: a reduction in size in the mid-14th-15th century, followed by increases in size in the mid-15th-16th century and again in the 17th century. Drawing upon the evidence from horse shoes and written records, we argue that the increase in size observed in the 16th century demonstrates the success of a legally enforced drive to increase the size of horses in England, during the reign of King Henry VIII.

077 OVERCOMING CHALLENGES OF SUSTAINABILITY IN ARCHAEOLOGY AND TOURISM

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Willems, Annemarie (Finland) - AW Heritage Consultancy; Friends of ICAHM; EAA Working Party: Integrating the Management of Archaeological Heritage and Tourism
Co-Author(s): Gowen, Margaret (Denmark) - EAA Board Member; EAA Working Party: Integrating the Management of Archaeological Heritage and TourismHøst-Madsen, Lene (Denmark) - Museum Skanderborg; EAA Working Party: Integrating the Management of Archaeological Heritage and Tourism
Keywords: Archaeology, tourism, sustainability, management,
Presentation Preference: Session with a key note speaker with contributions from discussants and discussion
Speaker: Peter DeBrine (not yet confirmed!!)

In 2015, international tourism marked an impressive six consecutive years of above average growth in terms of international tourist arrivals. That rate of growth is set to continue. Meanwhile, increasing tourist congestion at iconic tourist destinations, inadequate management and stakeholder engagement, inequitable economic 'share') and physical attrition become increasing challenges.
Archaeological sites that become significant and popular tourism destinations face a range of additional challenges in relation to sustainability. The reasons are numerous but include protection and maintenance, circulation and presentation and the articulation of cultural value of buried archaeological remains.
2017 has been declared the UN International Year of Sustainable Tourism Development. In its 2015 Annual report the UNWTO published the Siem Reap Declaration on Tourism and Culture, which underlines "that successful outcomes require engaging culture and tourism stakeholders, especially within all levels of government and public administrations, to address cross-cutting responsibilities in areas such as governance, community engagement, innovation and corporate social responsibility".
This session addresses the aims of the Working Party to; advocate archaeological representation in heritage decision making concerning interpretation and; and develop strategies for managing archaeological heritage for tourism considering the risks and opportunities of archaeological tourism.
This session seeks discussion about mutual reinforcement of both archaeology and tourism. How can we make the future cultural tourists aware and protective of the archaeological heritage? We aim to develop discussion on the principles outlined in the Siem Reap declaration and those promoted by the UNESCO World Heritage and Sustainable Tourism Programme.

01 DESTINATION MANAGEMENT AT UNESCO WORLD HERITAGE PROPERTIES

Author: Mr Debrine, Peter - UNESCO World Heritage Centre (Presenting author)
Keywords: World Heritage, sustainability
Presentation Preference: Oral

A destination is the physical space in which a tourist spends their holiday or vacation. It includes a full range of services, products and experiences:
- The attractions people visit
- The accommodation in which they stay
- The transport arrival hubs
- The food and drink establishments utilised
- The retail outlets in which they shop
- The museums and galleries they visit
- Even the city, town, village, or homes where the local community resides.

A World Heritage site (WHS) can be a destination in itself. However, more often it is located in, or part of, a wider venue, forming the key, or one of the key, attractions of the place concerned. The UNESCO World Heritage and Sustainable Tourism Programme is based on the need to manage tourism at a destination scale – managing the issues simply within the boundaries of the World Heritage sites would be ineffective. Defining your broader destination is extremely important in building foundations for sustainable tourism.

02 WTTC AWARD FOR PARKSTAD LIMBURG AND GLOBAL TOP 100 SUSTAINABILITY FOR THE REGION SOUTH LIMBURG

Author: Mrs Niewierra, Anya - VVV Zuid-Limburg; Discussant (Presenting author)
Co-Author: Mrs Niewierra, Anya - VVV Zuid-Limburg
Keywords: sustainability, world price
Presentation Preference: Oral

In 2016 Parkstad was winner of the WTTC award for best travel destination. Also the region of South Limburg was admitted to the top 100 green destinations. This because of the fact that we have a constant care for the beautiful landscape of South Limburg and because of the fact that we try to preserve the monuments by giving them a touristic destination.
Immaterial culture, like THe Via Belgica is given a new meaning in South Limburg.
Sustainibility is our DNA

03 EPHESUS AND MASS TOURISM

Author: Doz. Ladstaetter, Sabine - Austrian Archaeological Institute (Presenting author)
Keywords: Ephesus, Mass Tourism
Presentation Preference: Oral

"Ephesus - live your dreams!" With this slogan the tourism industry promoted a beach holiday with an integrated cultural program years ago. The ruins seem predestined for touristic use since the site is easily accessible by plane, car, bus and especially cruise ships and it is available 365 days a year. Ephesos records an average of two million visitors annually, making it one of the most visited archaeological sites worldwide. The visitor path through the ancient city is based on two criteria: on the one hand the time restrictions of the visitors must be taken into account and on the other hand all 'highlights' must be integrated into the tour. Ephesos is one of the most prominent examples for the commercialization of cultural heritage. The expectations and the objectives, but also the requirements of research, cultural heritage, and the tourism industry could not be more different. Mass tourism deforms excavations: the emphasis is not placed on the ruins, but on the services surrounding them. The ruins have to adapt to the visitors and not the visitors to the ruins. The daily schedule is determined by the program of the consumers, by transportation, the actual visit and provisions. Well-designed visitor paths, easy to understand signs and audio guides are required. The days in which the past was contemplated and the object in view was the focus of attention are gone; today the ruins are consumed according to modern leisure behavior and serve as a backdrop for performance and self-presentation.
Kitsch has no limits and the quality of some products could be improved. The great attraction of the ruins places considerable demands on the archaeology in Ephesos, however, it is necessary to not only live with this reality but to also actively participate in shaping it to the extent possible.

04 TOURIST DEVELOPMENT AND WORLD HERITAGE STATUS

Author: Dr Higgins, Valerie - American University of Rome (Presenting author)
Keywords: UNESCO, heritage tourism
Presentation Preference: Oral

When UNESCO launched the World Heritage List in 1975 its stated aim was to conserve the legacy of the past for future generations. However, with the passage of time the emphasis has changed. For certain sites being on the list is seen primarily as a means of increasing tourism and raising revenue. This broaches the question of whether World Heritage status is a protector of archaeological heritage or potentially one of the reasons for its deterioration. This paper will analyze the relationship between tourism, economic development, archaeological conservation and World Heritage status and will examine how we can best protect our archaeological heritage for future generations, whilst at the same time ensuring a sustainable growth in heritage tourism.

05 MAKING GRAN NICOYA GRAN AGAIN: PROJECTS TO MAKE NICARAGUA'S PRE-HISPANIC PAST AS A TOURISM RESOURCE

Author: MA, Current PhD student Montgomery, Paul Edward - University of York (Presenting author)
Keywords: Nicaragua, tourism, development
Presentation Preference: Oral

Tourism provides for a significant portion of the economies to many states. As an industry, it is fragmenting to provide ever more niche experiences for potential visitors. Heritage tourism itself makes up a substantial portion of the sector, with over one third of international visitors to the United Kingdom citing 'culture' as their major reason for entry. Nicaragua has been seeking to make tourism an ever increasing part of its economy. Eco-tourism/agritourism have made up the largest facet of utilized tourism resources. There are numerous alternative resources which have not been tapped into, but which have served as a marginal aspect of eco-tourism.
The Pre-Hispanic past of Nicaragua is one such aspect. This poster highlights the available resources, potentials to developing these into attractions and heritage tourism, as well as the reasons why this has largely not been. Two new projects (Ruta Gran Nicoya and Proyecto Hilo Azul) seek to develop Gran Nicoya as a cultural brand which can be used to benefit tourism as well as to provide platforms to educate visitors about and to decolonize Nicaragua's Pre-Hispanic past.

06 SIX ROMAN SHIPS ON SHOW ALONG THE LOWER GERMAN LIMES THE ROUTE TO A WORLD HERITAGE SITE BENEFICIAL TO ALL

Author: Doctorandus (Drs.) Hazenberg, Tom - 1Arch/Hazenberg Archeologie (Presenting author)
Keywords: tourism society benefits
Presentation Preference: Oral

In the context of the future UNESCO world heritage site, the Lower German Limes (a coalition of private and governmental organisations) co-operates in a huge project, restoring a collection of six massive Roman cargo ships that will be on exhibition in a new to build National Roman Ship Museum Archeon. Besides ambitions in the fields of science and tourism, the working group aims to contribute to other societal goals, like city marketing, education, and the reintegration of non-working people.

This short contribution shows the practice of developing an ambitious heritage project with various partners, all with their corresponding as well as varying interests and working attitude. The Dutch Roman cargo ships project offers the perfect opportunity to unite a wide range of interests. For that reason, it will be a good example of serving the world heritage with the commitment of the society, one of the aims of UNESCO. However, the road to that situation will be long and winding.

082 CLIMATE CHANGE AND ARCHAEOLOGICAL HERITAGE

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author: Biehl, Peter (United States) - University at Buffalo, SUNY
Co-Author(s): Vandrup Martens, Vibeke (Norway) - Norwegian Institute for Cultural Heritage Research (NIKU)Dalen, Elin (Norway) - Riksantikvaren/Directorat for Cultural Heritage
Keywords: Climate Change, Archaeological Heritage
Presentation Preference: Round table

This Roundtable is organized by the newly established EAA Task Force on Climate Change and Heritage (CCH) in order to (1) discuss and establish guidelines for an EAA Committee on Climate Change and Archaeological Heritage; (2) to discuss ways to monitor climate change as it relates to archaeology; (3) and to make recommendations concerning ways to enhance the EAA's effectiveness in addressing the multiple challenges posed by climate change to archaeological heritage.

100 EVERY END HAS A START: THE TRANSFORMATIONS OF NEOLITHIC SOCIETIES AND THE EMERGENCE OF NEW ETHNIC IDENTITIES.

Theme: 6. Interpreting the archaeological record
Author: Van Wijk, Ivo (Netherlands) - Leiden University
Co-Author(s): Amkreutz, Luc (Netherlands) - National Museum of AntiquitiesHofmann, Daniela (Germany) - University of HamburgHaack, Fabian (Germany) - Landesmuseum WürttembergFontijn, David (Netherlands) - Leiden University
Keywords: Neolithic societies, Ethnic identities, Migration
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

With archaeogenetic data becoming ever more widespread, it is time archeologists once again took the issue of ethnic identity in the past seriously. The tools for identifying migration events, both individual and at the group scale, are available but we have a limited set of theoretical models of how these events actually worked, as well as a very restricted vocabulary to describe processes of difference, mixing, change, encounter, (dis)continuity and innovation, hybidization and how these affect the self-identification of social groups.
This session focuses on the transformation of Neolithic societies at moments of 'rupture,' i.e. where significant changes in many or all aspects of life are apparent over a larger area and in a short time window. More specifically, we want to address whether such ruptures were associated with the formation of new ethnic identities. In particular, we wish to critically discuss the relation between ethnicity, material culture and migration events.
We therefore welcome contributions which reflect on:

- the specific social mechanisms which may connect ethnic groups at larger spatial scales
- the role of material culture in sustaining and altering these mechanisms
- the way in which ruptures relate to re-orientations of group identities, whether as cause or effect
- the kinds of situation in which new ethnic identities may arise, including, but not being limited to instances of migration
- the extent to which traditions of practice and behaviour are ways of mediating culture change

01 EMERGING IDENTIES, TRANSFORMING THE PAST

Author: Dr. Hofmann, Daniela - Hamburg University (Presenting author)
Co-Author: Dr. Amkreutz, Luc - National Museum of Antiquities (RMO)
Keywords: Neolithic, identity, genetics
Presentation Preference: Oral

The formation of group identity and the changes therein link to many aspects of the archaeological past. These days our scientific methods are becoming technologically more refined on a genetic level, while at the same time we deal with the same material representatives of the past from an archaeological perspective and try to interpret these within an ever-expanding theoretical framework with associated vocabulary. This places new and exciting challenges for our discipline. How do we combine these different sources of information and what does it tell us when they are in conflict. In this contribution an overview is given of recent developments in understanding the changes, ruptures and transitions taking place in the European Neolithic and how large-scale processes always have distinct local repercussions that together shape the way in which culture is transmitted.

02 CAUGHT IN THE CONCEPT OF CULTURE: HOW TO DEAL WITH MULTIPLE MIDDLE NEOLITHIC IDENTITIES?

Author: Assist. Prof. Iversen, Rune - University of Copenhagen (Presenting author)
Keywords: Identity, Middle-Neolithic, multiplicity
Presentation Preference: Oral

What to do if the present material culture does not fit any of our predefined cultural groupings neatly ordered in chronological and typological boxes? What if the material traces are vague, uncharacteristic and hard to delimit? We often describe such situations as periods of decline, cultural upheaval or even so-called dark ages. However, such periods can be seen as transformative. They are hard to label culturally because they frame the formation of new cultural, social or ethnic entities. One such period is the later Middle Neolithic in southern Scandinavia. At least four archaeologically defined cultural groups co-existed for c. 200 years occupying each their geographical core area: the Single Grave culture, the Battle Axe culture, the Pitted Ware culture and the late Funnel Beaker culture. But how to deal with a situation where these cultural assemblages are mixed and no clearly defined cultural repertoire is present? Should we 'invent' another cultural label to create 'cultural order' – or should we rethink our terminology and challenge the rigid concepts of culture? Defining ones culture isn't a straightforward task today – why should it have been in the past? Whereas the use of cultural labelling simplifies the socio-cultural reality this paper argues for increased socio-cultural complexity explaining the later Middle Neolithic.

03 NEOLITHIC REVISED. NEW DATA TO CHRONOLOGY AND POTTERY PRODUCTION IN THE MID 6TH MILLENNIUM CALBC IN THE MIDDLE DANUBE REGION.

Author: Dr. Tóth, Peter - Department of Archaeology, Faculty of Arts, Comenius University in Bratislava, Slovakia (Presenting author)
Co-Author: Dr. Barta, Peter - Department of Archaeology, Faculty of Arts, Comenius University in Bratislava, Slovakia; Mgr. Petřík, Jan - Department of Geological Sciences, Faculty of Science, Masaryk University in Brno, Czech Republic; Assoc. Prof. Dr. Pavúk, Juraj - Institute of Archaeology of Slovak Academy of Sciences in Nitra, Slovakia; Prof. Dr. Bátora, Jozef - Department of Archaeology, Faculty of Arts, Comenius University in Bratislava, Slovakia
Keywords: Neolithisation, Chronology, Technology
Presentation Preference: Oral

Beginning of the Neolithic in NW Hungary and SW Slovakia still represents an open question. Process of neolithisation is currently explained by several different viewpoints, whom dominate two opinions. The first one, represented by E. Bánffy and K. Oross, suggests that the earliest LBK can be directly linked to the Starčevo culture. Another opinion maintained by J. Pavúk suggests that the development of LBK was from the cultural-historical aspect autonomous and autochtonous, even though it was Starčevo culture which mediated the main principles of Neolithic way of life along the Danube. Both theories might be challenged by recent pottery finds from Santovka, which seem to be dated to 5850–5600 calBC (plant temper).
Comparison of the pottery-making technology from Santovka with that from above mentioned coeval cultures points to a difference, perhaps indicating different technological traditions, which do not fit into existing schemes.
Therefore, we revise the original pottery finds from four sites eponymous for the stages of early LBK in SW Slovakia (Nitra, Hurbanovo, Bíňa, and Milanovce) and investigate their pottery-making technology and absolute chronology. Thin sections and petrographic characterization will be accompanied by the acquisition of radiocarbon samples representing plant material used for tempering of clay in both fine and coarse wares. The results are hoped to contribute to knowledge on both chronology and technological aspects of pottery production in the region during the first half of the 6th millennium calBC.
This work was supported by the Slovak Research and Development Agency under the contracts nos. APVV-14-0550 and APVV-0598-10 and Czech Science Foundation under the contract no. 17-11711S.

04 THE ETHNOGENESIS OF WESTERN LBK REGIONAL GROUPS

Author: Dr. Strien, Hans-Christoph - Johannes Gutenberg-Universität Mainz (Presenting author)
Keywords: LBK networks regionalisation
Presentation Preference: Oral

Even in earliest LBK regional differences are visible. With the beginning of the Flomborn phase, the formation of regional groups is complete. This process may be understood as ethnogenesis, alloying groups of immigrants from different parts of the core area of the LBK and the local population to new regional units.It is not only visible by the stilistic differences between the regions, but also by the change from the supraregional communication networks of the different groups in earliest LBK to regional networks in Flomborn times. The new units remained stable at least until the regional end of the LBK

05 DEAL WITH IT! NAVIGATING SOCIO-ECONOMIC CHANGE IN THE NEOLITHIC OF NORTHWEST EUROPE

Author: Dr. Amkreutz, Luc - National Museum of Antiquities (RMO) (Presenting author)
Keywords: Neolithisation, Mesolithic, identity
Presentation Preference: Oral

The Neolithic is perhaps the most potent period for both economical and social change. Especially in the light of the many millennia of a hunting and gathering existence that preceded it, the changes that the Neolithic brought about were tremendous and took place on a hitherto unparalleled scale and at great speed. Although the past decades of research have brought down the validity of the arrival of a Neolithic or agricultural 'package' that was eagerly adopted it is equally clear that the livelihood of communities eventually changed drastically and that changes had potentially powerful economic, social and symbolical repercussions. This contribution seeks to present a number of case studies for the developing Neolithic in the Lower Rhine Area of Northwest Europe. This study region is particularly interesting since it both witnesses the introduction of the Neolithic in the form of fully-fledged LBK farming communities in the south, while at the same time there are other groups who are much slower to adopt to a farming way-of-life and adhere longer to aspects of a hunter-gatherer existence. The case-studies will focus on the different ways in which aspects of the Neolithic were negotiated and integrated and how this may have affected identity, both by the LBK and their successors as well as by those communities that are clearly rooted in the regional Late Mesolithic.

06 WIND OF CHANGE. UPPER SILESIA AT THE TURN OF THE AGES

Author: Dr Furmanek, Miroslaw - Institute of Archaeology, University of Wrocław (Presenting author)
Co-Author: Hałuszko, Agata - Institute of Archaeology, University of Wrocław; Mackiewicz, Maksym - Institute of Archaeology, University of Wrocław
Keywords: Cultural Change, Silesia
Presentation Preference: Oral

The region of Upper Silesia, located in the foreground of theMoravian Gate, played a vital role in the communicationand transmission of cultural patterns between areas situated south of the Carpathians and Sudetes and Northern Europe. Thanks to new discoveries and a recently initiated interdisciplinary program that includes remote sensing as well as genetic and isotope analyses, it is now possible to trace some of the transformations that took place during the 3rd and early 2nd millennium BC.
Abrupt social, cultural and population changes took place in Eurasia at that period. Does the local record reflect them? The new findings from Pietrowice Wielkie and Kornice provided us with a body of record, on which a frame of reference for generalisations regarding the pace and the mechanisms behind transformations which had brought about the appearance of new ethnic identities among the late Neolithic/early Bronze Age societies.
Burial rites, dwelling structures, land use and material culture were all implicitly related to the group identity. Thanks to a series of carbon dates from an unique series of settlements and burial sites it is now possible to trace the changes in these aspects of life. Anthropological analyses allowed us to evaluate the living conditions and biological stresses that shaped the general lifestyles of the buried individuals.
Based on the data we've gathered so far, we can try to interpret the cultural change that, if fact, often was inter-generational. On some occasions, that change was accompanied by intra- or inter-group rivalry. Numerous examples of trauma and injures found on the skeletons discovered in Kornice exemplify this very well.

07 TRACKING THE NEOLITHIC FALL: A LOOK FROM THE BALKANS

Author: Dr. Lazar, Catalin - National History Museum of Romania (Presenting author)
Keywords: Balkans, Neolithic, Identities
Presentation Preference: Oral

The 5th millennium BC was the time when the Neolithic Civilization in southeastern Europe has flourished. It is known as the 'golden fifth millennium' because of the progress made by people (e.g. the rise of tell settlements, new buildings, defense systems, cemeteries, the emergence of metallurgy, etc.).
The Neolithic decline was the result of a diachronic process, which seems to have multiple causes, and first signs become visible around 4200-4000cal.BC. Then, more than 600 tell settlements were burned and abandoned apparently in the same time, doubled by a palaeoeconomy decline, and material culture change. Many assertions were formulated about this ending process in order to identify the causes of it, among them being climate changes (cooler weather), floods and erosion processes, or even the sudden rise of the Black Sea, which caused an agriculture collapse. Another possible cause was the penetration of new populations from North Pontic Steppes area, which had a different lifestyle, paleoeconomy, and material culture, and that migration led to disappearance of Neolithic Civilization.
However, despite these opinions, the people from the 4th millennium BC often were labeled as Late Eneolithic/Copper Age/Chalcolithic, or transition period to Bronze Age. In the Balkans occurred major drastic changes in the material culture, habitation patterns, and palaeoeconomic strategies. Due to the pottery modification, the archaeologists defined several cultures as human markers of new realities (e.g. Cernavoda I, Galatin, Pevets, etc.), considered fundamentally different from the Neolithic Civilization.
The current paper will explore the complex interface between the environmental, biological, behavioral, and cultural factors in correlation with paleogenetic markers that shaped the new realities from the Balkans between 4200-3500cal.BC, with particular emphasis on Bulgarian and Romania.
This work was performed through the Partnerships in Priority Areas Program - PN II, developed with the support of MEN - UEFISCDI, project no. PN-II-PT-PCCA-2013-4-2302.

08 ETHNOGENESIS AND HYBRIDITY – THOUGHTS ON RUPTURES, SPLITS, AND MELTING POTS

Author: Dr Gramsch, Alexander - RGK - Romano-Germanic Commission DAI (Presenting author)
Keywords: Ethnicity, hybridity, exchange
Presentation Preference: Oral

The idea of 'ethnic identity' has tormented archaeological thinking since its genesis, particularly in Central Europe – from the essentialism of early antiquarianism via the search for 'ancestral homelands' in Kossinnist settlement archaeology to its revival in the 1990s. In my contribution I want to sketch briefly the historiography of this idea and discuss its gist, as well as some alternatives.
Currently archaeogenetic data are applied to support narratives of group migrations as causes for culture change. This requires a closer look at the concepts 'migration,' 'ethnicity,' and 'culture change,' since these narratives assume that migration as inferred from genetics caused cultural and at the same time ethnic change. I therefore want to discuss forms of migration and of identities, forms of boundaries and of cultural communication. Concepts of culture change need to be scrutinised together with concepts of cultural communication such as Creolisation, Cultural Entanglement and Hybridity. Different approaches carried out under the label 'hybridity' as well as further patterns of discourse which should complement 'hybridity,' such as 'purification' and 'petrification,' will be explored, and the contextual and temporary character of creating, negotiating and changing identities will be considered, understanding identity as a matter of group action and interaction. Causes for change can be endogenous as well as exogenous 'prime movers,' thus the possible nexus between the creation of cultural or ethnic identity and archaeogenetic data needs to be discussed.

102 ART CRIME AND STOLEN HERITAGE: TOWARDS AN ARCHAEOLOGICAL CONSENSUS

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Symonds, James (Netherlands) - University of Amsterdam (UvA)
Co-Author(s): Lostal, Marina (Netherlands) - The Hague University of Applied SciencesMorehouse, Lindsay (Netherlands) - University of Amsterdam (UvA)Weirich, Christine Acosta (United Kingdom) - University of GlasgowNotroff, Jens (Germany) - Deutsches Archäologisches Institut (DAI)Munawar, Nour A. (Netherlands) - University of Amsterdam (UvA)
Keywords: Middle_East_&_Northern_Africa, Conflict, Art Crime, Heritage
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The looting of archaeological sites is by no means a recent phenomenon and has been taking place in war zones for centuries. The incidence of illicit trade has, however, been significantly influenced in recent years by the growth of international art markets that are willing to accept/sell unprovenanced items. Examples of the privatisation of public monuments have added to the loss of cultural heritage by placing items in private hands. Additionally, social media platforms/cost sharing applications have provided readily accessible markets for art objects and archaeological artefacts.

In high-profile incidents worldwide, heritage and art have been targeted by treasure-hunters who have exploited political instability to openly plunder antiquities. The theft of cultural items has only served to deepen the psychological impacts of conflict in regions (MENA region) by removing cherished items of local/national heritage. Simultaneously, the growing trend for many public institutions to sell "unwanted" cultural items has led to a devaluation of heritage, encouraging unscrupulous private collectors to appropriate objects with little regard for their history, context or legitimate collection practices.

This session examines emerging trends in art crime and the grey market for stolen art. We address principles of stewardship of threatened archaeological materials in conflict contexts, attempting to identify new ways to overcome the current limitations on safeguarding heritage. Is it possible to work towards an international archaeological consensus and to develop strategies to enhance protection of the world's collective artistic patrimony? And can we discourage looting by exposing criminals and their willing accomplices in international markets?

01 "STOLEN HERITAGE". A CASE STUDY IN NEO-MODERN/POST-MODERN PAINTING

Author: Archaeologist Fleury, Beatrice - retired (Presenting author)
Keywords: painting, transmission, heritage
Presentation Preference: Oral

Painting does not come naturally to mind to testify cases of "stolen heritage": monumental representations are few, support perishable, proof not easy to trace; riots have destroyed the work. Inheritance laws raise sensitive issues, personal, political, leaving questions unattended.
This example could help distinguish between national and personal heritage; where the pieces are State acquisition, done legally, or by act of war, or "theft".
Myriam Belhiba, publishes a text of Roger Fleury who states the role of painting, weapon against "profane ignorance" in which he considers Belhiba's painting as "fresh improvisation".
Belhiba, a Tunisian painter, implicitly acknowledges the influence of her French mentor, but asserts the originality of her own paintings.
Reversely, Paul Vivien calls himself "pupil of the painter" Roger Fleury, eclectic artist, whose output reflects diverse traditions.
The profession of Fleury, architect and engineer, led his artwork to be scattered in developing countries, subject to independence upheavals, and repossession, making it difficult to recover. His work, distinctive, influences as well as reflects foreign and local traditions.
Some works of Fleury could be classified as copies: "Le faux Vlaminck", openly painted as such; inspired by the style of the period, Buffet, "Le cirque", or Braque "Le festin de roi". Later ones are real innovations and discovery; such is "Essai sur l' eau". "Friends", although acknowledging his originality, might call him a forger. This raises the question of the validity of the term "stolen" in terms of national heritage as well as in terms of copyright.
These issues cover a wider ground than that of illicit trade. Laws governing movement of art, ownership and their interpretation differ; the nationality of the artist and the place where the piece was created question the attribution to one national Heritage or another, and of its origin, and lead to controversies on intellectual property.

02 HEDAP (HERITAGE DOCUMENTATION AND PROTECTION): A TOOL TO FIGHT THE ILLICIT TRAFFIC OF LIBYAN ANTIQUITIES.

Author: Dr Leone, Anna - Department of Archaeology, Durham University (UK)
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Keywords: Libya, Artefacts, Looting
Presentation Preference: Oral

The International Council of Museums (ICOM) has published a "red-list" of Libyan antiquities at risk to alert customs officials of potential illicit trafficing of looted artefacts. The art market is full of artefacts coming from archaeological sites, storerooms and museums, but very few of those objects can have their provenance established if not documented or registered. With more than a hundred Cyrenaican Funerary Sculptures sold during the last ten years, recent research has proven that this illegal traffic moves very fast, but can be mapped and could be dismantled with the right tools.
Therefore, quick documentation of what can be looted and stolen is urgently needed. The project presented here, carried out in collaboration between Durham University, the Department of Antiquities of Libya (DoA) and ICOM, has developed a system called HeDAP (Heritage Documentation and Protection) to record and catalogue mobile objects and artefacts, towards the compilation of a database for international customs and police to use as a reference to quickly identify Libyan movable objects. The system consists of a mobile application (App), for field recording, that feeds into a database integrated with image-recognition software. Each recorded object has a photo ID comprising a set of images that defines its unique physical features (cracks, marks, etc...).
Although HeDAP is currently developed in cooperation with the Libyan DoA, a formal standardization of it, with the consultancy of ICOM, UNESCO and the international police and customs, could evolve into a wider toolset applicable in other MENA countries. Cooperation and data sharing between Libya and the international community have been fundamental in this process and represent the only sustainable way to discourage the wide and thick network of art criminals' activities at a worldwide level.

03 BASIC GROUNDWORK SUPPORTING THE PROTECTION OF CULTURAL HERITAGE: IDEAS FOR EDUCATIONAL CONCEPTS

Author: Dr Anvari, Jana - Flinders University; HerA Heritage Advisors (Presenting author)
Co-Author: Ideli, Andrea - HerA Heritage Advisors; Kruip, Margrith - HerA Heritage Advisors; Freie Universität Berlin; Notroff, Jens - HerA Heritage Advisors; German Archaeological Institute; Weiler-Esser, Julia - HerA Heritage Advisors
Keywords: cultural heritage, education
Presentation Preference: Oral

The Session "Art Crime and Stolen Heritage" aims to ask how to discourage the international illicit trade networks. We as HerA 'Heritage Advisors' are convinced that an effective and sustainable heritage protection can be only realised if society at large, and important protagonists in particular, understand their own past and identify with it. We are a team of young PhD-researchers and students who founded HerA in 2015 out of a student conference on the destruction of cultural heritage. This paper reports on our experience with creating engaging educational concepts for police and customs officials in Germany: those responsible for protecting not only archaeological finds in German soil, but also battling the illicit antiquity trade circling through Germany, which has recently become a major transfer route for antiquities looted from troubled areas in the Near East. As protagonists in the frontlines of the battle against illicit antiquity trade, police and customs officials, need to be encouraged to not view antiquities trade as trivial, or as unpreventable. Further, official require sufficient background knowledge to solve the often complex cases. The scope of the educational units provided by us reaches from relevant legislation to the principles of archaeological fieldwork and research, and can be delivered in teaching units of varying length. Archaeology students represent a second important target group for our educational concepts, which focus on providing a clearer understanding of the legislative framework of heritage protection as a toolkit for work as a professional archaeologist. We suggest that the aim of heritage education overall is principally to foster understanding for the importance of heritage and archaeological research, and to encourage a perception of personal responsibility for protecting heritage. Within this framework, this paper reviews theoretical and practical approaches towards heritage education.

04 CONFLICTING INTERESTS: AN EXPLORATION OF HOW CONFLICT ZONES HELP TO FACILITATE THE INTERNATIONAL ILLICIT ANTIQUITIES NETWORK.

Author: Ms Weirich, Christine Acosta - University of Glasgow (Presenting author)
Keywords: Crime-Prevention, Antiquities, Conflict-Zones
Presentation Preference: Oral

This presentation will explore how situational crime prevention, with the use of crime script analysis can examine the specific ways in which conflict zones facilitate the looting and trafficking of antiquities. While it is a seemingly obvious conclusion that conflict lends itself to criminal activity (such as illicit antiquities), there has been little criminological research into the operational structure and techniques that are commonly used for the purpose of the illicit antiquities in conflict zones. Crime scripting is the method of analyzing the essential steps necessary for a crime to take place. This presentation will discuss commonalities specific to conflict zones, and how they directly influence and facilitate the looting, trafficking, and sales of illicit antiquities on an international level – a number of case studies will be explored ranging from historical to current conflicts.

The ultimate goal of this research is to study common factors shared by similar case studies to help determine a better understanding of how such crimes operate, and therefore create effective crime prevention techniques or policy to help tackle the issue of the illicit antiquities network.

05 POST-CONFLICT ARCHAEOLOGIES AND COMMUNITY ENGAGEMENT

Author: MA, Current PhD student Munawar, Nour A. - University of Amsterdam (Presenting author)
Keywords: Syria, Post-Conflict, Public-archaeology
Presentation Preference: Oral

Since the beginning of the 20th century, archaeology as a discourse in the Middle-East has been characterised as being a specialty of the elite. This fact has been stimulated by the public attitude that tends to encourage their youth to go for more practical and "lucrative" sciences. This tendency has created a huge gap between society and archaeology as a discipline which ultimately resulted in neglecting any field that studies the material culture of the past. Postcolonial regimes that have been ruling the MENA region have also reinforced this gap. This argument is apparently supported by Syria's archaeology law, where the property of archaeology only belongs to the government. This has generated a top-down approach which asserted the idea of making archaeology as a discourse of the society's elite. Recently, the "reconstruction" of a replica of Palmyra's Arch under the supervision of the DGAM – the highest national authority of archaeological sites in Syria, is an illustrative example. It has been widely criticized for numerous reasons, one of which being the use of the top-down approach which neglected the viewpoints of local stakeholders.
The concern is now to continue working with such approach to reconstruct all the archaeological sites in the aftermath of Syria's war. I argue that such approach must be opposed and concurrently replaced by the bottom-up approach wherein the progression and decision can be generated from individual elements of the society to the whole. This can be attempted through the application of public-archaeology methods, constitutional reform, and promotion of (G)localisation of heritage. This paper goes on to investigate the possibility of applying the bottom-up approach in the post-civil-war recovery. I go beyond to show how the inclusion of individual and collective memories of locals in the reconstruction process can reimagine archaeology as an inclusive and healing discourse.

105 WHERE NOW IN CONFLICT ARCHAEOLOGY?

Theme: 6. Interpreting the archaeological record
Author: Carman, John (United Kingdom) - University of Birmingham
Co-Author(s): Van Lochem, Philip (Netherlands) - University of BirminghamKing, Christopher (United Kingdom) - University of Birmingham
Keywords: conflict, theory, context, debate
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The 21st century is shaping up to become one of the most bloody in human history. It is perhaps therefore no accident that Conflict Archaeology has emerged over past decades as an area of increasing interest and influence, as evidenced by its inclusion at a number of EAA and other conferences in recent years. What the field has generally lacked so far, however, is discussion of what Conflict Archaeology can tell us that other studies cannot. This session – abandoning the usual focus on archaeological studies of a particular conflict, period or type of site – seeks instead to open up a wider debate about what archaeological studies of violence are for.
Ours is an explicitly theoretical approach to a subject that is predominately concerned with issues of method. While a concern with method is valid and necessary, what lies behind it is an implicit understanding of why archaeologists should examine sites of past conflict but this is not enunciated in a clear manner. This session will seek to examine how an archaeological interest in conflict can inform us more deeply about this aspect of human behaviour.
We seek contributions that may be grounded in specific projects but which will provide the underlying rationale for them. We also seek more generalising contributions that place Conflict Archaeology in the wider context of archaeology as a regional and global field of activity. In short, we wish to debate the role of Conflict Archaeology in the context an increasingly violent world.

01 REACHING OUT OR REACHING IN? MAKING CONFLICT ARCHAEOLOGY RELEVANT

Author: Dr Carman, John - Ironbridge International Institute for (Presenting author)
Keywords: relevance, impact, theory
Presentation Preference: Oral

In launching the Journal of Conflict Archaeology in 2005, Tony Pollard and Iain Banks called for the closer integration of conflict archaeology with mainstream archaeologies. In 2007, we made a claim for the archaeology of battlefields as a pacifist endeavour, and more recently (in 2013) John Carman argued for the potential greater relevance of Conflict Archaeology to contribute to wider debates on war and violence, beyond archaeology alone. Those ambitions have perhaps still to be met because Conflict Archaeology is still relegated to specialist conferences and conference sessions.
So what is the best way forward for Conflict Archaeology to achieve its maximum impact? One is to reach out to other areas of archaeology beyond those related directly to conflict by identifying those aspects of conflict archaeology that can be drawn upon by others to the benefit of their own interests – theoretically, methodologically, or in terms of understandings of aspects of the past. Another is to invite others to contribute to the development of conflict archaeology by identifying those aspects of other branches of

archaeology (and indeed other fields) that will be of benefit in the work of understanding human conflict and violence and the locales where it takes place. Either would be of value in allowing the cross-fertilisation of ideas across disciplinary boundaries.
A third way forward would be the most radical – neither to reach out to others nor to invite others to reach in. Instead, we abandon a focus on conflict to the exclusion of other aspects of the past and instead put our methodological and interpretive skills at the service of archaeology more generally. This is neither a reaching out not a reaching in but a deliberate exercise in re-joining. But it also requires that others abandon their own claims to exclusivity too.

02 TO PRODUCE CONFLICT AS A MECHANISM OF SUPPRESSION, THE CASE OF SHEIKH KHAZAL SUPPRESSION, LATE 19TH EARLY 20TH CENTURY IRAN

Author: Dr. Dezhamkhooy, Maryam - Alexander von Humboldt Foundation, Heidelberg Universität, (Presenting author)
Keywords: suppression, conflict, Khazal
Presentation Preference: Oral

In recent decades, the conflicts and wars of modern times have enjoyed more attention. But the Middle East, has been scarcely investigated archaeologically.
For thousands of years, the diverse people of Middle East used to speak with different languages and experienced very different beliefs and religions. The historical order fell into a chaos just after discovering oil in the region in 1900. Followed by the First World War, the disintegration of Ottoman Empire and Qajar kingship, and the birth of new nation states the region involved in bloody struggles. However the new governments in the region, Iran and Turkey, claimed modernization and socio-political reforms, they started massive suppression.
Iran's first modern state produced the conflict to suppress the diversity of identities in particular among ethnicities, where a sense of belonging to the group is very significant. In a nutshell, the suppression includes some economic mechanisms completed by military attacks resulted in the destruction of collective identities. The case of Sheikh Khazal Bin Jaber, the local governor of Khuzestan province in late Qajar, presents how Arab minority of south western Iran became the victim, among too many others, of new state. He has lost his traditional power and dominance over Arab tribes.
Augmenting the case of Khazal, the paper tries to clarify how modern conflict can find very complex aspects including the production the very conflict in the purpose of systematic suppression. It also calls for more active contribution of indigenous archaeologist as they can provide a contextual understanding of the situation.
The Middle East crisis has rooted at least in policies led by Europeans and modern states in the beginning of 20th century. Conflict archaeology can participate not only in the study of last phases of conflict or its outcomes and material remains but also should investigate the underlying phases.

03 LANDSCAPES OF FORTIFICATION AND CONFLICT AS PROJECTS OF POLITICAL AUTHORIZATION AND SUBJECTIVIZATION IN THE BRONZE AND IRON AGE SOUTH CAUCASUS

Author: Dr. Lindsay, Ian - Purdue University (Presenting author)
Co-Author: Dr. Greene, Alan - New York University
Keywords: fortresses, Caucasus, complexity
Presentation Preference: Oral

In the mountainous expanse of the Armenian Highland (encompassing eastern Turkey, northern Iran, and the republics of Georgia, Armenia, Azerbaijan), the Late Bronze and Iron Ages (ca.1500-200 BC) are closely identified with material indicators of warfare. Structured violence is reflected among the material assemblages and iconography of mobile pastoral societies during the Middle Bronze Age, but with the onset of the Late Bronze Age, numerous hilltop fortresses and a dramatic increase in the quantity and diversity of bronze weapons suggest that violence gained singular prominence as a factor of sociopolitical life. Yet while fortresses served as the foci of Highland settlement systems for nearly a thousand years, few archaeological studies in the Caucasus have assessed exactly how violence and conflict were manifested in the lived experiences of ancient communities or evaluated the institutional mechanisms through which warfare constituted authority, created and dissolved political association, and shaped identities and political economies. In this paper, we discuss the long-term role of fortress-based systems of settlement and political economy in the South Caucasus with a perspective that looks beyond the functionalist logics of territorial defense and sees forts as arenas of social differentiation and segmentation, monumentalism, ritual, and political display with important implications for the establishment and maintenance of political subjectivities. Framing the relations between warfare and complexity this way forces us to rethink traditional views of conflict that cast war as a strategic, evolutionary contest among elites seeking political and material advantage (i.e., for food, land, mates, slaves, prestige items). We illustrate these issues through the results of recent survey and test excavations in the upper Kasakh River Valley in northwestern Armenia, a multi-year program set within our longer-term study of the origins and development of ancient sociopolitical complexity in the South Caucasus.

04 CAPITALISM IS CONFLICT: RECONSIDERING SUBTLE AND COVERT VIOLENCE WITHIN MARGINALIZED COMMUNITIES

Author: Dr Anderson, Christine - Berea College (Presenting author)
Keywords: capitalism, Scotland, Appalachia
Presentation Preference: Oral

Conflict archaeology is well positioned to challenge and expand upon processes we have come to accept as standard by our 21st century governments and corporations. This paper considers capitalism and, as an extension, globalization as the root of the conflict and violence and calls for a more nuanced understanding of practices that isolate and erase distinct ethnic, social, and economic groups from the physical and ideological landscape. These processes of "clearing" are not new, but are ones which, I argue, are essential for western, capitalist nations must employ to survive. They are violent and are evidenced not only by direct, physical action, but also subtle and covert policies we recognize as "normal." To parse out the subtle and covert, I compare two marginalized regions as a point of discussion: 18th century Dumfries and Galloway, Scotland and southern Appalachia, in particular Eastern Kentucky, United States and draw from theories of discipline and cultural, structural, and symbolic violence. Conflict resides in a myriad of spaces, including virtual ones, so to be archaeologists in the 21st century means seeking material culture and its production in much broader terms.

05 GIVING A VOICE TO THE VOICELESS: EXPLORING MARGINALISED NARRATIVES OF CONFLICT ON A PACIFIC BATTLEFIELD

Author: Dr. Raffield, Ben - Uppsala University (Presenting author)
Co-Author: Dr. Knecht, Rick - University of Aberdeen; Prof. Price, Neil - Uppsala University; Mr. Lindsay, Gavin - University of Aberdeen
Keywords: Conflict, Pacific
Presentation Preference: Oral

In recent years, archaeologists have developed increasingly sophisticated methodologies for the study of past conflict. Numerous projects have shown that the archaeological record, when studied alongside archival materials including first-hand accounts, historical mapping, and (for more recent conflicts) photographic and video evidence, can yield incredibly detailed insights into the human experience of war. However, archaeological perspectives of conflict can easily become biased by the survivability of these additional sources. When "history is written by the victors", what does this mean for our knowledge and understanding of other groups that are affected by conflict? These might include defeated combatants, the civilian populations that they represented, or the inhabitants of war zones who may have had no direct interest or stake in the violence itself.

In this paper, we will explore the role that archaeologists can play in nuancing, and even overturning traditional narratives of conflict by including the experiences of marginalised groups within their research. In doing so we will discuss the results of two seasons of fieldwork conducted on the island of Peleliu, Palau, which in 1944 was the scene of one of the bloodiest battles of the Pacific War. The rich material legacy of the battle, which survives in the jungle today, offers a unique opportunity to reconstruct the multi-faceted experience of warfare as it was confronted by both combatant and non-combatant groups. These include not only the defeated Japanese military forces, but also Korean and Okinawan forced labourers who were used to construct the garrison's defences. Also of paramount importance are the experiences of the island's indigenous population, whose homes were torn apart by the conflict and whose lives remain affected by these events today. Acknowledging these varied perspectives represents an important step in understanding the monumental scale of the trauma generated by warfare.

06 THE ARCHAEOLOGY OF CONFLICT AND FEMINIST THEORY

Author: Spencer-Wood, Suzanne M. - Oakland University; Harvard University (Presenting author)
Keywords: Feminist Theory
Presentation Preference: Oral

Feminist theory provides new insights into conflicts by focusing on gender power dynamics that occur in many conflicts. The neglect of the violence against women and children in conflicts from wars to muggings and domestic violence can be addressed from a critical feminist perspective. Most conflicts are perpetrated by men in patriarchies and feminist theory critiques, analyzes and seeks to eliminate patriarchy. Radical feminist theory analyzes how patriarchies systematically condone violence against women. Archaeology provides material and spatial analyses of conflicts that are absent in historical research. Archaeologists need to be careful not to legitimize conflict by researching its antiquity. Although conflict has a long human history evidence of it has not been found on sites of the earliest hominids, contradicting claims legitimizing violence as genetic and biological in sociobiology or evolutionary psychology. A recent article in Nature by a male academic is just the latest in a long history of articles justifying violence as innate.

07 QUEENS IN THE SAND: THE PROBLEMS OF INVESTIGATING NEO-ASSYRIAN BATTLES

Author: Ms. Bennett, Eleanor - University of Birmingham (Presenting author)
Keywords: Assyria, warfare, reliefs
Presentation Preference: Oral

The Neo-Assyrian period (c. 934-612 BC) is notorious within ancient near Eastern studies for its brutal warfare. Mass militarised expansionism was the key feature of the period, which was done through brutal battles using harsh punishments for defeated enemies such. Yet there is a great problem when discussing the warfare of the Assyrians, as comparatively little archaeological evidence of the actual battles has survived. This paper will use a case study from my own work to illustrate the problems with studying warfare in this period. That will be the battle between Samsi, 'Queen of the Arabs', and Tiglath-Pileser III in 733 BC. A notable aspect of this battle is that this was between a female military leader and a king of a very patriarchal society, but this paper shall only discuss this briefly. Unfortunately, other than Samsi's flight from battle, the burning of her camp, and her surrender to the Assyrian king, there is very little detail about the conflict itself. Even its location is problematic. Each of these issues shall be dealt with in turn, and this paper shall demonstrate how they have been overcome thus far. Finally, this paper will outline the future possibilities modern archaeological technologies like GIS (or Geographic Information Systems) pose for the study of Neo-Assyrian warfare. The study of the landscape in areas where we believe battles took place can greatly illuminate our understanding of how these battles took place, and what the possibilities were for the Assyrian and Arab forces.

08 BATTLEFIELDS AND THE WIDER LANDSCAPE

Author: Mr King, Christopher - University of Birmingham (Presenting author)
Keywords: Conflict, Landscape, GIS
Presentation Preference: Oral

Advances in technology and the wider area of focus within Conflict Archaeology has driven the discipline forward and opened up broader areas of study, one significant area being the study of battlefields within the context of the wider natural and anthropogenic landscapes.

Using technology such as Geographic Information Systems (GIS) as well as incorporating techniques and sources from Landscape Archaeology, Military History and Military Theory can allow for a greater amount of detail in contextualising battlefield location in the landscape and how this may change over time. This is significant, as while the understanding of individual battlefields is substantial, the understanding of what factors affect the location of historic battlefields in the landscape is less well known. In addition, researching the context of battlefield location necessitates the inclusion of a study into the contemporary view on the landscape, understanding what features were considered significant, and which were not, this is also a vital element in the understanding of conflict in the past, as well as the nature of battlefield location.

This suggests that research into this area can provide not only a framework for studies into battlefields themselves, but also an analysis of contemporary behaviour through the medium of spatial analysis. This research is potentially the future of Conflict Archaeology, with greater inclusion of other theoretical frameworks and analysis techniques from other subjects to better understand conflict, and its place in history.

09 CONFLICT ARCHAEOLOGY AND THE POTENTIAL OF BATTLEFIELD RESEARCH IN THE NETHERLANDS

Author: van Lochem, Philip - The University of Birmingham (Presenting author)
Keywords: Conflict Archaeology, Netherlands
Presentation Preference: Oral

The lack of initiatives to research, record and conserve battle sites in the Netherlands has made the issue of conservation pressing. This paper will discuss the potential of Conflict Archaeology in the research of battle sites in the Netherlands. In a discipline that is above all concerned with methodology, it will explore the question of why the study of battlefields is important and how this question is addressed within Conflict Archaeology.

109 WORK SMARTER, NOT HARDER:INTEGRATED ARCHAEOLOGICAL APPROACHES TO OCCUPATIONAL HEALTH IN PAST SOCIETIES

Theme: 6. Interpreting the archaeological record
Author: Radini, Anita (United Kingdom) - University of York, UK
Co-Author(s): Nikita, Efhtymia (Cyprus) - STARC-The Cyprus Institute
Keywords: Archaeology Occupational Health, Labour
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Occupational health is a major issue in the modern workplace with numerous professionals specializing in keeping employees in good health and, subsequently, more productive. It is striking that according to health organisations, in the UK over half a million people are annually injured at work, with overall economic costs in the order of billions of pounds.
It is reasonable to anticipate that occupational health was similarly a major issue in past societies, both for the individual and the broader society. Nevertheless, the health status of different categories of works has rarely been the topic of systematic study in archaeological contexts. Several papers have focused on the reconstruction of past activity patterns by means of osteological data, and an extensive literature explores past health and disease in different contexts, but not often in association with specific professions.
The aim of this session is to introduce more systematically the key topic of occupational health in archaeological discussions by examining it in a multidisciplinary perspective.
To this end, the proposed session will consider different lines of evidence that provide insights to past occupational health and hazards, their impact on the individual and the population and how they can be amalgamated. Evidence from written sources, artistic representations, bioarchaeological approaches of a macroscopic and microanalytical nature, and ethnoarchaeological accounts will be explored, combined together wherever possible. As such, the selection of papers will elucidate aspects of health in the working environment for different occupations in societies across time and space.

01 LANIFICA PROJECT: THE ROLE OF WOMEN IN ROMAN TEXTILE CRAFT THROUGH THE EVIDENCE GIVEN BY FUNERARY CONTEXTS

Author: Dr. Rossi, Cecilia - Università degli Studi di Padova (Presenting author)
Co-Author: Dr. Canci, Alessandro - Università degli Studi di Padova
Keywords: Roman, Women, Textile
Presentation Preference: Oral

Together with the care of children and household, the textile craft was in Antiquity the main activity for women. Some kind of change happened only in Roman times: according to literary and epigraphic sources the first textile workshops appeared in Rome in the mid Republic, spreading even elsewhere in the first Imperial age, with both female and male workers. The domestic spinning and tailoring, firstly addressed by women to satisfy the clothing needs of the family, began to be flanked by a sort of proto-industrial production of cloth and garments for sale.
Conceived as a further development of the research branch the University of Padova has for years now carried out on Roman Textile Archaeology, the LANIFICA project is aimed to clarify the role of women in Roman textile manufacturing, with particular attention on Northern Italy and North-western provinces.
Based on an in-depth appraisal of the evidence given by funerary contexts, the approach is quite unusual for classic studies and consists of a multidisciplinary analysis of a great sample of graves characterized by textile tools as part of the grave goods. What was the role of these objects with regard to the funeral celebrations? Which kind of woman was portrayed? Which social and economic rank were they referring to? What was the age group they were aimed to represent?
The project is intended to answer these questions, combining the clues given by both archaeological and osteological data: considering together the position of the grave, the structure and the burial rite, the composition and nature of the grave goods, the age, gender and possible pathologies or bone modifications related to the use of textile tools. In few words aim of this research is to shed light on the social and ideological context in which women lived and acted in Roman times.

02 LIVING, BREATHING BEINGS: LINKING SKELETAL PATHOLOGY AND DENTAL CALCULUS, A CASE STUDY FROM AN INDUSTRIAL TOWN.

Author: Dr Speller, Camilla - University of York
Co-Author: Miss MacKenzie, Lisa - University of York; Dr Radini, Anita - University of York (Presenting author)
Keywords: microscopy, calculus, allergens
Presentation Preference: Oral

The post-medieval period, and particularly the Industrial Revolution (1750-1850), witnessed a sharp rise in respiratory irritants and maxillary sinusitis resulting from rapid urbanization, factory work and unbridled fossil fuel burning. It has been postulated that maxillary sinusitis could be vastly underestimated in the past without visualization of the paranasal sinuses in intact skulls. Modern clinical studies state that exposure to wood and textile debris and their accompanying fungal colonies are responsible for an entire host of inflammatory reactions and chronic disease. Coupled with poor urban air quality, lack of hygiene, and malnutrition, visualization of disease and pathogens together is possible by combining skeletal and microscopic analyses. Here we discuss the implication of dental calculus finds from individuals that lived in the industrial Yorkshire town of Halifax which exhibit maxillary sinusitis. We evaluate such finds, their implications to health and we contrast them with dental pathologies such as draining abscesses, multiple caries, severe periodontitis, and stress indicators throughout life such as dental enamel hypoplasia. It is proposed here that causative physical evidence for maxillary sinusitis can be gleaned from utilizing optical microscopy in the study of human dental calculus shown as respiratory irritants trapped in the mouth.

03 EXPLORING PAST OCCUPATIONS FROM THE MICRO-TO THE MACRO-BIOARCHAEOLOGICAL SCALE: A CASE STUDY FROM MEDIEVAL ENGLAND

Author: Dr Nikita, Efthymia - The Cyprus Institute (Presenting author)
Keywords: occupation, dental calculus
Presentation Preference: Oral

This contribution explores the association between different macroscopic skeletal markers that have been employed extensively as activity indicators in bioarchaeological studies worldwide and various types of occupational microdebris embedded in dental calculus. The aim is to test the extent to which entheseal changes, cross-sectional geometric properties of long bone diaphyses, osteoarthritis, and dental macrowear data indeed reflect the repetitive activities in which past individuals engaged or not. As a case study Medieval material from the United Kingdom will be used where the activities of males and females are well-documented. As such, this contribution aims at tackling a key osteoarchaeological topic, that is, the extent to which past occupations can be identified macroscopically on skeletal remains. The systematic macroscopic and microscopic bio-archaeological study, which has been conducted on the material under examination in the context of a collaborative project between the speaker and colleagues from BioArCh at the University of York, will allow the multifaceted exploration of this topic as it will give the opportunity to test both general patterns of association between the macroscopic and microscopic occupational evidence as well as more specific correlations between individual macroscopic activity markers and specific categories of occupational microdebris.

04 EXPLORING OCCUPATIONAL HEALTH IN THE MEDIEVAL PERIOD USING EXPERIMENTAL ARCHAEOLOGY AND 'DIRTY TEETH'

Author: Delaney, Sarah - University of York (Presenting author)
Co-Author: Dr Alexander, Michelle - University of York
Keywords: Experimental, Medieval period
Presentation Preference: Oral

Everyday non-dietary activities occupied a significant portion of people's lives in past societies. While archaeological artefacts are indicative of the skill of the crafters, the hardship and health impact that such activities caused often remains neglected. This paper uses experimental archaeology to gain a better understanding of the airborne particle load that may be inhaled while working textiles and thus infer the potential health hazards associated with the craft during Medieval period. The experiments are based on finds of microdebris entrapped in dental calculus where flax and wool fibres have been found at a frequency that would suggest textile processing, such as spinning or working wool or flax, leading to inhalation of large numbers of fibres. The debris inhaled during this processing would have likely have had an impact on the health of the respiratory system in these individuals. Here we report on experimental work conducted to better understand how textile working over a prolonged period may impact on the frequency of textile particles inhaled and whether this can be distinguished from everyday wearing of textiles as clothes.

05 COMPARATIVE ANALYSIS OF HUMAN DENTAL MICROWEAR FROM ST. MICHAEL'S AND ST. PETER'S PARISHES IN LEICESTER.

Author: Nesterova, Elena - The University of Sheffield (Presenting author)
Co-Author: Miss Lawrence, Lucy - The University of Sheffield
Keywords: Human dental microwear
Presentation Preference: Oral

Dental microwear analysis has been increasingly used to study the dietary habits of both extinct and extant animal species, as well as those of ancient human populations. This ongoing research is looking at two Late Medieval cemeteries from St Michael's and St Peter's parishes in Leicester. Despite the close proximity of the parishes it is presumed that their congregations had significantly different social standings. Dental microwear analysis is conducted by creating positive casts of the second mandibular molars. Low Magnification Microwear (LMM) images of the casts are generated using a stereomicroscope with an external light source and the High Dynamic Range (HDR) method is used to enhance visual details in the images. The research aims to establish whether it is possible to detect any disparity in dental microwear patterns between the groups. Any notable dissimilarities in microwear patterns may be used to infer variations in food processing practices, dietary patterns and occupations between different social groups during this key time period.

06 WOMEN, HEALTH AND THE ANCIENT "CRAFT" OF COOKING: AN ARCHAEOLOGICAL PROSPECTIVE

Author: Dr Radini, Anita - BioArCh, University of York (Presenting author)
Keywords: Health, gender, cooking
Presentation Preference: Oral

This paper explores the hazards associated with the use of biofuel in traditional home cooking and how they can be tracked in the human past. Using ethnological evidence and experimental archaeology, this study evaluates the gender inequality in exposure to pollutants associated with the division of household chores, still present today in many developing countries. It examines the potential of identification of such pollutants in the archaeological record, by combining novel data from dental calculus and burnt residues on pottery. The paper aims to highlight the potential of archaeology to contribute to our understanding of the history of occupational health hazards and health outcomes in ancient homes.

119 MADE FROM FIRE AND STONE – THE PHENOMENON OF VITRIFIED FORTS

Theme: 6. Interpreting the archaeological record
Author: Posluschny, Axel (Germany) - Keltenwelt am Glauberg
Co-Author(s): Ralston, Ian (United Kingdom) - University of EdinburghRichter, Benjamin (Germany) - Goethe-University Frankfurt
Keywords: Vitrified forts, ramparts, Iron Age
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Hillforts enclosed by walls which have been heavily affected by high temperatures that resulted in the stones of their fortifications melting are a phenomenon that is known widely across Europe. To date a few hundred instances of vitrification of diverse dates but mainly from the Iron Age have been proposed in the archaeological record. Since the

discovery of the first vitrified fort and its publication by John Williams in 1777 a lively debate has developed as to whether vitrification was a constructional technique designed to strengthen these fortifications, or a process that was the accidental by-product of the destruction by firing of these enclosures.
The session aims to bring together scholars to discuss the phenomenon of vitrified forts and to exchange ideas and experiences on this topic. A special focus shall be given (but is not restricted) to the following aspects:
- Where in Europe (and further afield) can the phenomenon of vitrified forts be identified?
- What impact did the geology of the stones used to build the ramparts have on the nature of the vitrification, i.e. did higher temperatures need to be attained successfully to melt particular rock types (e.g. is the process of calcifying limestones comparable)?
- Are there chronological differences in the presence/absence of vitrified walls in different regions of Europe?
- Which new results of archaeological observations/fieldwork are available?
- Do (new) chemical and physical analyses of sites and lab or field experiments support any of the existing interpretations rehearsed above?

01 THE PHENOMENON OF VITRIFIED FORTS – AN INTRODUCTION

Author: M.A. Richter, Benjamin - Goethe Universität (Presenting author)
Co-Author: Dr. Posluschny, Axel G. - Keltenwelt am Glauberg
Keywords: Vitrified Forts
Presentation Preference: Oral

The phenomenon of vitrified forts, which are to be defined as fortifications which have been heavily affected by high temperatures that resulted in the stones within their walls melting, where discovered a long time ago. The vitrified forts were initially regarded as a Scottish Phenomenon first published by John Williams 1777. But shortly after the initial discovery the phenomenon attracted attention in Central Europe and further vitrified enclosures were found in Saxony, Bohemia and France. Today the Phenomenon of vitrified forts is widely known across Europe. Not only has the number of identified Hillforts with vitrification increased, it spawned a lively debate throughout researchers. Two conflicting theories have emerged, which argue whether the vitrification was a constructional technique designed to strengthen the fortifications, or an accidental by-product during the process of their destruction through burning.
The paper will give an Introduction to the session "Made From Fire and Stone – The Phenomenon of Vitrified Forts". It provides on one hand with a short overview of the research history and the theoretical debate regarding vitrified forts. On the other hand it will illustrate the range of various rock types used for the vitrification and their occurrence over time.

02 VITRIFIED FORTS AND RELATED SITES IN BRITAIN AND IRELAND GARY LOCK, OXFORD UNIVERSITY, AND IAN RALSTON, EDINBURGH UNIVERSITY, BOTH UK

Author: Professor Ralston, Ian - University of Edinburgh (Presenting author)
Co-Author: Professor Lock, Gary - University of Oxford
Keywords: Vitrified forts, cartography
Presentation Preference: Oral

The AHRC-funded Atlas of Hillforts of Britain and Ireland project, a collaboration between the Universities of Oxford, Edinburgh and University College, Cork, involved the construction of a database with details of over 4000 sites in these islands, some 3349 of which are confirmed as hillforts. Inclusion within this category entails each site exceeding at least two of three thresholds defined in terms of enclosed area, scale of enclosure and topographic setting. Preparation of the database was underpinned by a critical review of HER (Historic Environment Records), NMR (National Monuments Records) and published information on all candidate sites.
Questioning the database allows the extraction of information on vitrification and other evidence of burning from the ramparts of these sites, enabling us to produce a new series of maps to examine the distributions of these phenomena at a wider scale than hitherto attempted. These characteristics can also be mapped against evidence for the inclusion of timber frameworks in the complex architecture of the enclosing works of hillforts, notably both walls including vertical posts ('box ramparts' in English usage) and those laced with only longitudinal and transversal timberwork.
In a series of commented maps, this poster will explore these characteristics and others (including the enclosed areas of vitrified sites and evidence for dating) in order to outline the wider context of the vitrified forts of the British Isles.

03 BURNT BRONZE AGE FORTIFICATIONS BETWEEN THE TAUNUS AND CARPATHIAN MOUNTAINS

Author: M.A. Richter, Benjamin - Goethe Universität (Presenting author)
Keywords: Vitrification, Hillforts, BA
Presentation Preference: Oral

Vitrified forts are mostly seen as a phenomenon of the Iron Age but the burnt and vitrified fortifications of the Bronze Age are as uncommon as often thought. The research project "Prehistoric Conflict Research – Bronze Age Fortifications between Taunus and Carpathian Mountains" collected a large number of these sites. The sites them-selves had only researches as individual fortifications or put in a small region up to now. As part of my PhD thesis on "The Phenomenon of the Bronze Age Vitrified Forts between the Taunus and the Carpathian Mountains" I will deal with the burnt Bronze Age fortifications of this area as a unified phenomenon and try to attain new perceptions on the causes of vitrification and the distribution of the sites. I will further attempted to define vari-ous types of burnt fortifications.
The poster presents the current distribution data from our project and highlight some examples of burnt fortifications from the Bronze Age within my area of research.

04 VITRIFIED FORT, GLASS FACTORY OR...? THE IRON AGE "SCHLACKENWALL" (SLAG WALL) ON THE DONNERSBERG (PALATINATE, GERMANY)

Author: Dr. Zeeb-Lanz, Andrea - GDKE Rheinland-Pfalz (Presenting author)
Keywords: glass-production, rhyolite, Schlackenwall
Presentation Preference: Oral

Inside the fortification of the huge late Celtic oppidum on the Donnersberg there are the rests of a further rampart with an upstream ditch, the so-called "Schlackenwall". Early excavations in the 1930s led to the interpretation of a drywall construction of local stone (rhyolite) and wood which was thought to have been burnt and to be responsible for

the abundant vitrified rhyolite fragments found in the vicinity of the wall, the rhyolite chunks deformed and covered with thin layers of glass. New excavations in 2004 proved the nonexistence of a stone-wood wall – the small elliptical fortification undoubtedly consisted of a mere earth bank, interspersed with lots of crude rhyolite pieces. Not a single vitrified rhyolite fragment could be documented in the filling of the wall – but a secondary small ditch, dug into the primary ditch in front of the rampart was densely packed with vitrified stones. Mineralogical examinations lead to the conclusion that the rhyolite must have been heated under air exclusion as the resulting glass contains extremely reduced iron particles. A hypothesis developed by mineralogists from the University of Mainz aims at intentional processing/heating of rhyolite for glass production in Celtic times – but the excavations in the area surrounded by the rampart did not yield any signs of glass ovens, raw glass drops or other production remnants. Therefore the paper aims at presenting the enigmatic facts concerning the vitrified rhyolite around the "Schlackenwall" for discussion in the plenum; new propositions for the origin of the Donnersberg rhyolite slags and their function will hopefully arise from the presentation.

05 BURN HILLFORT, BURN – DUN DEARDAIL INFERNO

Author: Ms Dolan, Amanda-Jane - University of Stirling (Presenting author)
Co-Author: Dr Wilson, Clare - University of Stirling
Keywords: Vitrification, Hillfort, Scottish
Presentation Preference: Oral

"One of the greatest mysteries of humankind", Arthur C. Clarke

The vitrification of Iron Age hill forts occurs when the timber framed stone built rampart is destroyed by fire. The fire can generated temperatures (>1000°C) that can melt the rubble core of the defensive walls, however vitrification does not occur at every burnt site. The process of hill fort vitrification is still not fully understood and no one has successfully recreated this process, in the field, in modern times. There are still many questions regarding the geological processes of vitrification and also the temperature that these rocks melted at. This presentation seeks to discuss the comparison of Scottish vitrified hillfort sites, primarily Dun Deardail and Craig Phadrig, and attempt to answer some of these questions.
Geological investigation has recognised that Iron Age hill forts are constructed using localised materials and there has not been pre-selection of rock with increased fusibility. Laboratory and field analysis have been used to ascertain their geological composition, to identify the changes vitrification has had on mineralogical configuration and whether the temperature of melt can be determined by using a combination of different chemical analytical techniques.

Preliminary laboratory analysis has concluded that the temperature of the melt at both Dun Deardail and Craig Phadrig were in the region of 1000-1200°C and using data from several analytical methods and experimental furnace melting evidence will be presented about the temperature of the vitrification and also the constraints that geology has on the vitrification process.

I will also discuss preliminary data where I have used Mössbauer Spectroscopy, in conjunction with more traditional analytical techniques as a method for determining the peak melt temperature of melted rock in during the vitrification process.

06 REMARKABLE PLACES; ORDINARY LIVES? THE ARTEFACTS FROM DUN DEARDAIL AND OTHER VITRIFIED HILLFORTS IN SCOTLAND.

Author: Dr McLaren, Dawn - AOC Archaeology Group (Presenting author)
Keywords: Artefacts, Hillfort, Scotland
Presentation Preference: Oral

The vitrified hillforts of Scotland are a well-known but little understood site type. Basic questions remain over their chronology, character of occupation and the purpose of the vitrification of the enclosing ramparts. This lack of understanding of the mechanisms and purpose of the vitrification process, hampered by the small number of modern excavated Scottish examples, have often led to these sites being regarded as enigmatic and exceptional; concepts which have been applied beyond the structures themselves to the people that once lived and interacted with these sites in prehistory. What can the artefacts recovered from these sites tell us about the activities that took place at vitrified forts in Scotland? Are the objects left behind by the occupants of these sites also exceptional or do they reveal a similar story to those from contemporary un-vitrified enclosed settlements in Scotland?
This paper seeks to consider the significance of the artefact assemblage recovered from recent excavations at the vitrified hillfort of Dun Deardail, Lochaber, Scotland. Investigation of the objects recovered during excavation enables insights into the day-to-day activities and craft processes taking place at the site in the Iron Age, exploring the occupants' access to raw materials, networks of contacts and exchange, as well as shedding light on aspects of identity and personal ornamentation. The artefact assemblage from Dun Deardail will then be considered in its wider context, exploring objects from other vitrified forts in Scotland, to attempt to understand whether the character of occupation at these sites was as remarkable as the processes that led to the conflagration of the enclosing ramparts.

07 DATING THE VITRIFICATION OF DUN DEARDAIL, SCOTLAND USING NEW METHODS OF FIRE EVENT RECONSTRUCTION

Author: Dr Hawthorne, Donna - AOC Archaeology (Presenting author)
Co-Author: Dr McLaren, Dawn - AOC Archaeology
Keywords: Scotland, Vitrification, Dating
Presentation Preference: Oral

The vitrified hillfort of Dun Deardail, near Fort William, Scotland is a prominent feature in the landscape of Glen Nevis, however its history and purpose has always remained a mystery. Recent excavations have begun to unravel the story of life in the hillfort and its period of occupation, showing that the ramparts were constructed of stone around a timber framework which were set alight, reaching temperatures of over 1000 degrees centigrade, resulting in the vitrification of the enclosure. The reasons for this conflagration are unclear but the resulting smoke and charcoal would have been expelled into the atmosphere and subsequently deposited in surrounding sedimentary records. This record, accessed though retrieval of sediment cores, is used to model past fire events over time, using statistical methods of interpolation, decomposition, smoothing, peak identification and screening, to identify their magnitude and frequency, highlighting the vitrification. Radiocarbon dating and Bayesian modelling provides a robust chronology to pin-point the precise timing of the vitrification event. Utilising charcoal analysis for this new application and robustly dating the vitrification of the hillfort, could revolutionize the interpretation of other vitrified hillforts. This paper explores the relationship between the surrounding landscape and the activities at the hillfort of Dun Deardail, through traditional pollen analysis and new and novel methods of charcoal analysis, seeking to determine the exact timing and magnitude of the vitrification of the hillfort, and how the Iron Age people

were utilising the landscape, through farming, grazing, crop production, deforestation and burning. This paper is the first of its kind, using environmental indicators to augment the story of the vitrification of a Scottish hillfort, seeking to give an insight into the lives of its occupants.

08 THE VANISHED VITRIFIED FORT OF SCHWARZENBACH-BURG, AUSTRIA - A MULTI-DISCIPLINARY STUDY

Author: Fera, Martin - University of Vienna (Presenting author)
Co-Author: Kucera, Matthias - Ludwig Boltzmann Institute for Archeological Prospection; Schneidhofer, Petra - Ludwig Boltzmann Institute for Archeological Prospection; Neubauer, Wolfgang - Ludwig Boltzmann Institute for Archeological Prospection; Doneus, Michael - University of Vienna
Keywords: vitrified, hillfort, 3D-documentation
Presentation Preference: Oral

The multi-period hillfort of Schwarzenbach-Burg, 80 km south of Vienna, Austria, has been in the focus of multi-disciplinary research of the University of Vienna for more than two decades. While the best preserved remains of a large fortification wall (Kelheim-style) and ditch can be dated to the Late Iron Age (LIA), excavations in the inner part of the settlement revealed older traces of preceding ramparts enclosing a smaller part of the hilltop. During three seasons of stratigraphic excavations at one site, evidence was found that this rampart was destroyed by a massive fire impact. In LIA the remains were flattened to provide space for a workshop. For the construction of this older rampart, a timber frame was filled with stone material extracted on the outside of the rampart, synchronously forming an outside ditch. Due to the locally very variable geology, different types of bedrock were extracted and used for the filling, which was recognisable in different forms of vitrification. It ranges from melted orthogneiss to calcite marble processed like calcified limestone. The use of 3D-laserscanners for single surface documentation and in-situ and lab measurements of the susceptibility of the burnt structures in their context, lead to a data set that can contribute significantly to a better understanding of the formation processes of these features. Forthermore, integrating additional results, from topographic studies and geophysical measurements, helps clarify the chronological position and the motifs for vitrification.

09 VITRIFIED WALLS IN THE IRON AGE OF WESTERN IBERIA: NEW RESEARCHES FROM ARCHAEOMETRY APPROACHES.

Author: Professor Dr Berrocal-Rangel, Luis - Universidad Autónoma de Madrid
Co-Author: Ms Ruano, Lucía - Universidad Autónoma de Madrid (Presenting author)
Keywords: Vitrification, Ramparts, Fortifications
Presentation Preference: Oral

The presence of ramparts with vitrified stones in the West of the Iberian Peninsula is a very well-known fact from several archaeological sites, according to geo-chemical analyses and archaeological researches. The first of these were carried in the 'Proyecto Evora', a British and Portuguese program about the Iron Age settlement of this city of Sothern Portugal whit the contribution of prof. Ralston. After these first discoveries, there have been other findings such as Passo Alto, a site with the most southern uprights stones bands in Iberia. We can find others cases over a vast area of Western Iberia, most of them located between the Guadiana and Tajo rivers. According to the stratigraphies and radiocarbon samples, these sites are dated from the Late Bronze Age to the Late Iron Age, and the explanations involve different historical and functional contexts. This is the case of Ratinhos (Moura), a quite significant example of vitrified wall beside the main gate of its acropolis. Radiocarbon samples date this rampart in the mid-8th Century BC, as it was shown in the neighbouring Passo Alto. We know other examples on the northern lands of Beiras and Salamanca. At the archaeological site of Sabugal Velho, El Gasco and Villasrubias, vitrified stones are found along the whole perimeter of the ramparts. This fact is notorious for El Gasco, where the popular name of the archaeological site is 'El Volcán'. Recent archaeological fieldwork support a date probably related to the Roman Conquest. Therefore, these fires can be ascribed to war conflicts but also they could be considered as the result of a building technique for strengthening the fortification structures as we could infer from Nossa Senhora da Cola, where the walls were built with vitrified stones with a high cooper content.

I20 BETWEEN RESEARCH HISTORY AND CUTTING-EDGE ANALYSIS: CULTURAL TAXONOMIES AS THE BUILDING BLOCKS FOR THE EUROPEAN STONE AGE

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Fernández-López de Pablo, Javier (Spain) - Institut Català de Paleoecologia Humana i Evolució Social (IPHES)
Co-Author(s): Riede, Felix (Denmark) - Department of Archaeology, Aarhus University
Keywords: Taxonomy, Cultural Evolution, Palaeolithic, Mesolithic
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Constructing units and placing these units into taxonomies is a necessary part of archaeological practice. Without taxonomies we can nether construct nor interpret culture history, not can we hope to build bridges across regions and time periods. However, many of the units we use – facies, cultures, technocomplexes and the like – are inherited from much earlier days of archaeology, their exact meaning and the methods used for constructing them often obscure to today's practitioners. Troublingly, contemporary explanatory concerns often do not concerns themselves with such dry matters as archaeological taxonomy and hence run the risk of perpetuating the use of analytical units that may rest on less-than-robust epistemological foundations.
We fear that the potentially flawed nature of our analytical units may prevent us from correctly interpreting basic culture-historical sequences. In addition, because in Europe, the cultural taxonomical units within the Late Upper Palaeolithic and Mesolithic periods vary from region to region, it is challenging to compare and correlate changes across regional or national borders as part of broader processes of technological innovation, cultural transmission and population dynamics. In this session, we aim to foster open debate on just how archaeological analytical units and taxonomies are or should be constructed.
We invite contributions that examine such archaeological units and taxonomies in research-historical perspective, contributions that attempt to build bridges between different time periods or regions, as well as contributions suggesting new ways of constructing analytical units and frameworks.

01 FINDING THE PIONEERS OF THE NORTH – MORE THAN JUST A DATA PROBLEM (ASKING PHILOSOPHICAL QUESTIONS ABOUT HUNTER-GATHERER RESEARCH)

Author: Dr. Grimm, Sonja - SFB 1266 Scales of Transformation; Centre for Baltic and Scandinavian Archaeology (ZBSA), SSHL Schloss Gottorf (Presenting author)
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Keywords: pioneers, epistemology, Lateglacial
Presentation Preference: Oral

The human expansion northwards after the Last Glacial Maximum (LGM) is a subject of ongoing research and remains a matter of debate: Who were those pioneers? Where did they come from? When did they move northwards? What made them move to the North? And how shall we identify evidence for these questions in the archaeological record? The archaeological record of the Lateglacial expansion to the North can be described as a small group of snapshots in time and space with vast areas of unknown and uncertainty between them. These obscure areas are traditionally filled with models of how, when, and why people moved into unfamiliar landscapes. In addition, different approaches were used to identify push and pull factors to embed the earliest pieces of evidence and/or the related models in the ongoing climatic, geographical, and environmental transformation of northern Europe after the LGM. In combination, these approaches, models, and data help answering some of the above questions to better understand the mobility of hunter-gatherer groups and human expansion behaviour.
From a theoretical (philosophical, anthropological) point of view, our many models and approaches can be considered as epistemological representations of the ontology of past realities as revealed to us in our archaeological record. So studying the complex processes of human expansion and palaeo-environmental change as well as their interplay during the Lateglacial, we should make ourselves self-conscious of our chosen representations - their difficulties, problems, pitfalls and blindspots – and what alternatives we might thereby be casting outside.
With this contribution, we hope to cast light upon the presumptions of some of our current approaches to hunter-gatherer mobility in general and pioneering movements in particular. In our exploratory and suggestive paper, we will try to exemplify what these critical points mean for the analysis of the pioneers of the North.

02 CULTURAL TAXONOMY IN THE RUSSIAN UPPER PALAEOLITHIC

Author: Dr Reynolds, Natasha - Université de Bordeaux (Presenting author)
Keywords: Russia, Palaeolithic, dating
Presentation Preference: Oral

In parts of Western and Central Europe we have reasonably detailed chronologies of change throughout the Upper Palaeolithic and Mesolithic, which are to a greater or lesser extent suitable for comparative work. Eastern Europe, including European Russia, has historically been more problematic in this respect. Sites attributed to Upper Palaeolithic archaeological cultures known in Western and Central Europe (e.g. Aurignacian, Gravettian) are also found in Russia. However, there are several archaeological cultures (e.g. Streletskian) that are described only in Russia or Eastern Europe. The chronological and cultural relationships between these taxonomic units are not fully resolved. Furthermore, cultural change within these units has historically been poorly understood.

Constructing a robust and detailed culture history for the Russian Upper Palaeolithic, suitable for comparison with culture histories of other areas of Europe, is a key challenge for archaeologists interested in this area. The task is made difficult by the nature of the archaeological record itself, which consists almost entirely of open-air sites with short cultural stratigraphies, and which lacks deep cave sequences. The difficulty of reliably radiocarbon dating this time period, and the large number of inaccurate dates existing in the literature, also pose problems. Other issues include particularities of the research history of Soviet and post-Soviet Russia, as well as language and communication barriers.

Despite all of this, some significant progress has been made in recent years in improving our understanding of Upper Palaeolithic cultural taxonomy in Russia. Here I present examples of this progress, and discuss the importance of differentiating between various types of chronological and archaeological descriptors. Furthermore, the importance of a critical attitude towards the dating of sites, as well as the usefulness of re-studying lithic assemblages, are highlighted.

03 2D GEOMETRIC MORPHOMETRIC ANALYSIS REVEALS REMARKABLE DIVERSITY IN FINAL PALAEOLITHIC LARGE TANGED AND ARCH-BACKED POINTS

Author: Dr. Hoggard, Christian - Department of Archaeology and Heritage Studies, Aarhus University. (Presenting author)
Co-Author: Dr. Riede, Felix - Department of Archaeology and Heritage Studies, Aarhus University.
Keywords: Taxonomies, Palaeolithic, Geometric-Morphometric
Presentation Preference: Oral

Larged tanged and slender arch-backed points – known by a variety of nationally or regionally specific labels such as Federmesser, Tjonger points, penknife points, and Bromme, Lyngby, and Teyjat points respectively – are key lithic artefact classes of the Final Palaeolithic in Europe. Ever since Schwabedissen's (1954) synthesis of this material, researchers have been thriving to identify salient differences in the aspects of these tools in order to circumscribe particular regional phenomena, which were then often linked to causal explanations for such regionality related to raw material availability or the environment. These range from Schwabedissen's original Wehlen, Rissen and Tjonger groups, to the Fürsteiner, Atzenhofer and Ostromer groups suggested later, to fully-fledged 'cultures' such as the Perstunian and Brommean. In 1998, Ikinger suggested, however, that the actual variability observed in arch-backed points does not support these groupings. Likewise, Kobusiewicz (2009) made a similar argument in relation to the large tanged points, detailing their problems as a diagnostic artefact class. We here re-visit these suggestions through a detailed shape analysis of a large sample drawn from both artefact classes using two-dimensional geometric morphometrics. Our analysis covers these artefact classes' entire geographic and chronological range, and reveals a great deal of shape diversity and little in the way of meaningful structure. Our results indicate that typological assessments of arch-backed points are fraught with difficulty, and that regional archaeological 'cultures' as well as internal sub-groupings of the arch-backed point techno-complex based on suggested differences in point aspects are hard to sustain.

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04 TECHNOLOGICAL TRADITIONS AS PROXY FOR SOCIAL CONTACT AND CULTURAL DEVELOPMENT

Author: Researcher Berg-Hansen, Inger Marie - Museum of Cultural History, University of Oslo (Presenting author)
Keywords: Technological tradition, Final/Post-Glacial
Presentation Preference: Oral

In Final Palaeolithic and Mesolithic Northern Europe, tanged points especially, but also other formal tools, have been the centre of attention, largely defining a diversity of archaeological cultures or groups. The basis for this has been a morphological-typological approach within the frame of national and regional perspectives. However, our understanding of the significance of this morphological variation is limited, hence the relationship between the archaeological groups remain unclear.
This focus on formal tools, which comprise only a fraction of the archaeological material from most sites, leaves the waste from lithic production virtually unexplored. The dynamic-technological approach, based on the chaîne opératoire perspective, conversely offers a useful basis for studying this material. Previously in Northern Europe, this approach has mostly been used for studying intra-site activities, raw material economy, production methods and techniques, levels of skill, and developments of special crafts. This presentation however argues that based on the premise that social and cultural relations are reflected in transmission of culture-specific knowledge through social learning, and that this can be traced in lithic production concepts and methods, it is possible to identify the technological practices which separates or binds together technological traditions. In a comparative study of the development of the Final Palaeolithic and Early Mesolithic societies of Scandinavia and Northwest Germany, it has been possible to identify the development and spread of such lithic technological traditions, presenting a picture that differs from the ones drawn by typologically defined categories.

05 ARCHAEOLOGICAL ENTITIES AND COMPARATIVE TAXONOMY DURING THE PLEISTOCENE-HOLOCENE TRANSITION IN THE IBERIAN MEDITERRANEAN REGION

Author: Prof. Alday Ruiz, Alfonso - Universidad del País Vasco UPV/EHU
Co-Author: Prof. Aura-Tortosa, Juan Emili - Departamento de Prehistoria y Arqueología, Universidad de Valencia; Dr. Fernández-López de Pablo, Javier - Institut Català de Paleoecología humana i Evolució Social (IPHES) (Presenting author)
Keywords: Epipaleolithic, Iberia, Taxonomy
Presentation Preference: Oral

The Pleistocene-Holocene transition in the Iberian Mediterranean region witnessed the replacement of the well-recognized Final Magdalenian and Early Azilian archaeological taxonomical units by other lithic assemblages characterized by micro-blade debitage, and composite armatures (backed bladeletes, points and microliths). Those assemblages have been defined under different research traditions as Epimagdalenian, Epipaleolithic, Microblade Epipaleolithic and Sauveterroid). Besides the denomination issues, nowadays the main discussion points entail: i) the phylogenetic relationship regarding previous lithic traditions; ii) the degree of cultural interaction or differentiation among different Mediterranean territories; and iii) their relationship regarding the Sauveterrian taxonomical unit.

This paper aims to contribute to build a first reference framework to debate the second discussion point on the basis of the comparative taxonomy and the chrono-stratigraphic sequences among the regional units of the Mediterranean arch, the Upper Ebro Valley and the Southern Pyrenees.

06 THE SIGNIFICANCE OF EXPEDIENT BEHAVIOR IN THE DEFINITION OF CULTURAL TAXONOMIES: THE MESOLITHIC CASE

Author: Dr. Vaquero, Manuel - Universitat Rovira i Virgili; Institut Català de Paleoecologia Humana i Evolució Social (IPHES) (Presenting author)
Co-Author: Ms. Alonso, Susana - Universitat Rovira i Virgili; Institut Català de Paleoecologia Humana i Evolució Social (IPHES)
Keywords: Mesolithic, Expediency, Technology
Presentation Preference: Oral

A large part of the archaeological variability is based on the degree of investment in technical activities. Some assemblages exhibit a low-cost behaviour, aimed at minimizing the time and effort invested in technology. In the case of lithic production, this low-cost, expedient behaviour may become apparent in all the stages of the chaîne opératoire, from raw material provisioning to tool manufacture. More importantly, this behaviour has important implications concerning the amount of information transmitted in learning processes, which are the base of cultural traditions. From the first Mode 1 industries, these expedient assemblages are ubiquitous throughout Prehistory, sometimes coexisting or alternating with more elaborate, high-cost technologies. In the Iberian Peninsula, these assemblages are particularly common at the beginning of the Holocene, marking the end of the Upper Palaeolithic traditions that were dominant during the Late Pleistocene. These Mesolithic expedient industries from the Early Holocene are known under different names (Asturian, Macrolithic Mesolithic, Mesolithic of denticulates and notches), but all express the same phenomenon: the spread of low-cost technical behaviours coinciding with the Pleistocene-Holocene boundary. We will discuss the implications of technical expediency for the definition and interpretation of the taxonomical units identified in the Mesolithic. In particular, we will focus on the cultural meaning of these units, especially in comparison with the technical traditions characterizing the Late Upper Palaeolithic. Finally, we will address the potential significance of expedient technologies as proxies of important social and behavioural changes occurring during the Pleistocene-Holocene transition.

07 APPROACHING LAST HUNTER-GATHERERS MOBILITY BY MEANS OF THE LITHIC RECORD

Author: Dr. García-Puchol, Oreto - Universitat de Valencia
Co-Author: Student Cortell-Nicolau, Alfredo - Universitat de València (Presenting author); Dr. McClure, Sarah B. - The Pennsilvania State Universtiy; Dr. Barton, Michael - Arizona State University; Dr. Juan Cabanilles, Joaquim - Museu de Prehistoria/Servei d´´investigació prehistórica Diputació de València; Dr. Diez-Castillo, Agustín - Universitat de València; Dr. Pardo-Gordó, Salvador - Universitat de València
Keywords: Mesolithic, Lithic, Mobility
Presentation Preference: Oral

The analysis of lithic assemblages provides interesting ways to explore land-use strategies within Behavioral Ecology paradigms. In this presentation we apply analytical methods to investigate how the variation in the lithic record can help us understand prehistoric mobility patterns. We use indices derived from lithic technology in order to investigate patterns of mobility focusing on the Late Mesolithic sequence in Eastern Iberia. The key site of Cueva de la Cocina (Dos Aguas, Eastern Iberia) provides the case study to analyse diachronic variation of forager mobility over a millennium, taking into account data on regional spatial settlement patterns. Our goal is to determine how theoretical models regarding land use strategies (aggregation and logistic sites) produce significant results regarding curated and expedient compounds as a proxy for land use strategies within a refined Bayesian chronological approach. This multi-component analysis will allow us to test hypotheses about the interactions of settlement patterns, landscape, and lithic technology, providing a greater understanding of the socioecological dimension of lithics and Mesolithic people.

08 CONTINUITY AND CHANGE IN THE LATE MESOLITHIC PERIOD. A CASE STUDY FROM SOUTH-EAST NORWAY

Author: Fossum, Guro - Museum of Cultural History University of Oslo (Presenting author)
Keywords: Norway, Mesolithic, technology
Presentation Preference: Oral

The current Mesolithic chronology in Southeast Norway from 1975 is based on a typological classification of artefacts from few archaeologically excavated sites, stray finds and a limited amount of radiocarbon dates. Recently, the Southeast Norwegian Mesolithic chronology has been subject to critique and revision. This critique is founded on the substantial amount of high-resolution data generated from development-led excavation projects, but also a shift from typologically-driven studies to a focus on lithic technological processes.

This paper discusses how the chronological framework has shaped our research and notion of the Late Mesolithic period in Southeast Norway. The chronological framework has guided how scholars have dealt with the different Mesolithic periods, and the rather coarse time-resolution in the archaeological record has favoured the long-term perspective. The Late Mesolithic period has been synonymous with the so-called Nøstvet culture (c. 6300-4700 cal. BC), and the phase is associated with emerging sedentism and social complexity. The 1700 year long Nøstvet phase has traditionally been regarded as an entity and often studied in a long-term perspective as a prelude to the Neolithic period. Within the existing chronological framework, the chronological differences are viewed as gradual processes amongst local hunter-gather groups. However, new results demonstrate that we need to reconsider our conceptions and definitions of what constitutes the different Mesolithic periods in Southeast Norway. I argue that the long-term perspective mask the complexity and the dynamics of the Late Mesolithic. In light of new radiocarbon dates, comprehensive site assemblages and a focus on lithic technology it is possible to identify diversity and breaks, long-lasting cultural traditions, changing networks, and movements of people in the Late Mesolithic.

09 APPROACHING THE NEOLITHIC AS A CONSTRUCT: TERMINOLOGICAL CONFUSION IN LEVANTINE RESEARCH

Author: Dr. Richter, Tobias - Department of Cross-Cultural and Regional Studies, University of Copenhagen
Co-Author: Sæhle, Ingeborg - NIKU - Norwegian Institute for Cultural Heritage Research (Presenting author)
Keywords: Terminology, Neolithic, Levant
Presentation Preference: Oral

This paper deals with the definition of the Neolithic construct in Levantine archaeological research, and discusses why using a construct with a high level of abstraction as the defining characteristic of a chronological period is fraught with both terminological and taxonomical complications.

Based on her excavations at Jericho (Tell es-Sultan) in the 1950s, K. Kenyon introduced the Pre Pottery Neolithic A (PPNA) period as the first Neolithic period in the Levant (Kenyon1957: 29f). Kenyon was greatly influenced by G. Childe's concept of "the Neolithic Revolution", which equates Neolithic societies with sedentary, food-producing societies. In recent years, however, it has become clear that, in Southwest Asia, the transition from a mobile, hunter-gatherer way of life, to a sedentary food-producing stage, did not start within the Neolithic period. There is now evidence that the socio-economic shift towards sedentism and agriculture was a slow process with roots in the Early Epipalaeolithic, and that Levantine archaeological assemblages are not "Neolithic" in the Childean sense before the late PPNB. Despite this, the chronological use of the term Neolithic has not changed since Kathleen Kenyon introduced the PPNA as the start of the Neolithic in the late 1950's.
Through an analysis of the European origin of the term "Neolithic" and its subsequent introduction as a cultural-chronological marker in Levantine archaeological research, this paper seeks to discuss the validity of the Neolithic as a functional and specific archaeological construct. It will be argued that the Levantine archaeological material does not support the Epipalaeolithic-Neolithic transition occurring between the Natufian and PPNA periods, and that the current placement of this transition only encourages further confusion regarding the defining characteristics of the Neolithic period in the Levant.

122 WORKING TOGETHER: HOW SHOULD EAA AND CIFA COLLABORATE?

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author: Belford, Paul (United Kingdom) - Clwyd-Powys Archaeological Trust
Co-Author(s): Fernandez-Gotz, Manuel (United Kingdom) - University of EdinburghHinton, Peter (United Kingdom) - Chartered Institute for ArchaeologistsHueglin, Sophie (Switzerland) - Organisation of the Foundation Pro Kloster St. Johann in Müstair
Keywords: professionalism, collaboration, EAA, CIfA
Presentation Preference: Round table

The Boards of the European Association of Archaeologists (EAA) and the Chartered Institute for Archaeologists (CIfA) are considering how our two institutions can collaborate to advance shared objectives. This session will begin with a description of the two organisations, looking at their roles and objectives. We will look at what they have in common, and where they differ. We will also present the preliminary ideas from the EAA and CIfA Boards, based on that analysis, on how and when we might work together, or separately but in complementary ways. The purpose of the Round Table is to allow members of both organisations to comment and advise on the evolving ideas, to guide future discussions between EAA and CIfA.

01 AN INTRODUCTION TO CIFA

Author: Hinton, Pete - CIfA
Co-Author: Dr Wait, Gerald - CIfA (Presenting author)
Keywords: Professional institutes
Presentation Preference: Oral

CIfA is a professional institute, testing, recognising and developing the technical and ethical abilities of archaeologists. EAA describes itself as an association for all professional archaeologists – but has a much wider membership than that. To help us get to know each other, to complement an introduction to EAA, and to start discussion, this succinct presentation will consist of a CIfA selfie.

131 OBVIOUSLY, THERE WAS SOMEONE BEFORE THE VIKINGS... CASE-STUDIES FROM THE DARK-AGES OF NORTHEASTERN EUROPE.

Theme: 6. Interpreting the archaeological record
Author: Jansone, Santa (Latvia) - University of Latvia
Co-Author(s): Dworschak, Nina (Germany) - Romano-Germanic Commission of the German Institute of ArchaeologyChilinska, Agata (Poland) - none
Keywords: Scandinavia, Baltic, archaeology, Pre-Viking Age
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

More and more attention has been drawn to Scandinavian expansions in the Viking period to the expense of its predecessing age which laid the foundations for later expansion. Scandinavia had never experienced more drastic changes than it did in the late Viking Age: on the one hand there was expansion and movement, while on the other, states were being formed in Scandinavia itself. However, one cannot forget that there were raiders and settlers long before the Viking period in whose footprints followed the evolution of the culture and warfare of the nations involved.
This session centres in on that important precedent – the Migration Period and the pre-Viking Age. We welcome papers concerning Scandinavia, western Russia, the Baltic States, Poland and eastern Germany. We wish to include both smaller case studies as well as those theoretical and methodological approaches that would enlighten our knowledge of the periods in question. Papers should concern the connections of tribes that settled the Baltic Sea Basin, as well as cultural transformations, trading networks, transport, new discoveries (be they in the ground or in the archives), burial customs and/or settlement archaeology.
While the impact of the Viking phenomenon on the historical development of those regions may be out of the question, the questions which remains is how those social groups lived before the Viking-Age. What can we say about their identity and their way of life by examining the archaeological record?

01 SETTLEMENT DYNAMICS AND AGRICULTURAL DEVELOPMENT OF SOCIETIES IN LITHUANIA IN THE FIRST MILLENNIUM AD

Author: Dr Velius, Gintautas - Administration of the State Cultural Reserve of Kernave
Co-Author: Minkevicius, Karolis - Vilnius University (Presenting author); Dr Vengalis, Rokas - Lithuanian History Institute
Keywords: Settlements, agriculture, archaeobotany
Presentation Preference: Oral

For the most part of 20th century Lithuanian Iron Age archaeology was focused on artefact studies and tackling questions of ethnicity. Consequently, other subjects such as studies of settlements, social organization and subsistence systems of communities attracted little to no attention. Therefore, most of what we claim to know about the communities in Lithuania during the 1st millennium AD comes from historical sources. Unfortunately, the vast majority of them date from 9th century onwards and the information they contain is relatively scarce.

This has resulted in us having a distorted view of the prehistory of the region. A little is known about what life was like during the pre-Viking Iron Age. Most of the significant developments are attributed to the very end of 1st - beginning of 2nd millennium, whether it be changes in settlement dynamics or simply advances in agriculture (i.e. adoption of crops like rye or buckwheat).

Nonetheless, research focus in Lithuanian Iron Age studies has been gradually shifting for the last several decades. Archaeological fieldwork in Kernave has presented new evidence which allows us to re-evaluate our understanding of what life was like during the pre-Viking Iron Age. This site is of an exceptional importance due to its considerable life span and the extensive amount of data collected during previous excavation seasons. Recent spatial analysis has revealed that settlement's structure was very different from what was assumed before. At the same time, archaeobotanical analysis indicates that major agricultural developments were already implemented as early as mid-1st millennium AD. This encourages to reconsider what we know about settlements before the Viking Era. It also poses a quaestion whether they were really that different compared to the beginning of the 2nd millennium AD?

02 PREPARING FOR THE VIKING PERIOD – THE DEVELOPMENT OF IRON TECHNOLOGY IN SCANDINAVIA DURING THE MIGRATION PERIOD

Author: Mr Jouttijarvi, Arne - Heimdal-archaeometry (Presenting author)
Keywords: Iron, technology, development
Presentation Preference: Oral

In the Roman Iron Age, the blacksmithing technology in Scandinavia was restricted to forming of tools and weapons from available pieces of iron, with little knowledge of different qualities of metals such as iron and steel. Steel is only found in imported objects that were obviously important symbols of prestige and power.
More advanced technical traditions and knowledge of materials were used in the Roman Empire and in the Celtic areas. During the Migration Period was clearly a development in forging technology and knowledge of the materials that were looking forward to the very high quality and advanced use of iron, steel and phosphorous iron, as seen in weapons and tools from the Viking era.
Developments in the understanding of materials and techniques can be followed through metallographic analyzes of objects like knives and swords. You can f. Ex see how the steel in the Roman Iron Age appears only in imported items that have had a great prestige significance. Later appear the steel in the articles without being recognized by the blacksmith who made them, while less hard phosphorous iron was known and used for cutting edges. Finallythe steel is in the Viking Age used with a high degree of perfection, and advanced materials as crucible steel is known from the so-called Ulfberht sword. Fragments of crucible steel at Norwegian smithies suggests, that that the processing of the material might even have been mastered by some blacksmiths.

03 MIGRATION PERIOD BETWEEN ODRA AND VISTULA: NEW SOURCES, NEW IDEAS

Author: Prof Bursche, Aleksander - University of Warsaw
Co-Author: Dr Zapolska, Anna - University of Warsaw (Presenting author)
Keywords: coins, Barbarians, imitations
Presentation Preference: Oral

Brief results of 5-year Project „Migration Period between Odra and Vistula" (cf. www.mpov.uw.edu.pl) realised by the international team will be presented in the context of new archeological and natural sciences data including pollen, radiocarbon, DNA or isotopic analysis.
Transfer of technology from late Roman Empire to Barbaricum and political conflicts were the main reasons and mechanisms of the migration both to the South - Western Roman Empire and backwards to the North - Scandinavia.
New sources from central and northern Poland testify continuation of settlement activity of elite character in so-call central places, emporia, logistic and power centers, having evident traces of Germanic character, until 7th c. AD. Undoubtedly we have to deal with German-Slavonic coexistence, what explains, between other, continuation of hydroniums (water names?), cf. Vistula.

In the light of the most recent results we have to deal with relatively short hiatus from mid 7th until end of 8th century AD, when the first Scandinavian material appeared again at the southern Baltic coast. Perhaps we have to deal with survival in elite's memory in the North (runs, sagas) relationship between inhabitants of Scandinavia and of the lower Danube/Ukraine region through lower Vistula territory? It could be a good explanation of the one of the most important direction of Varangians expansions on European continent.

04 THE ARCHITECTURE OF DEATH IN ESTONIA: INSTALLATION, DEVELOPMENT AND CONTINUITY OF FUNERARY STRUCTURES DURING THE PROTOHISTORY

Author: Dr. Abbate, Stefano - Independent researcher (Presenting author)
Keywords: Death, Architecture, Estonia
Presentation Preference: Poster

The protohistoric researches in Estonia show a significant complexity about archaeological mortuary evidences especially about funerary structures. An intensive inter-cultural interaction among Scandinavian and Baltic Region communities has produced important record that allow us to identify several evidences connected with funerary architecture; indeed, the estonian social identities are reflected in different grave typologies that identify specific chronological phases.
The aim of this project is to provide an overview of mortuary architecture in Estonia in order to clarify the origin, the development, the continuity and the overlap of funerary structures, by comparing different phases by creating graphs of chronological sequences and birth-death sites; in this way we can to assign the different structure types to chronological phases: which kind of architecture is typical of a stage? Did the Estonian protohistoric societies re-use ancient structures over time? By means of analysis of typology, spatial distribution, chronological framework and anthropological data associated with funerary architecture, it is possible to provide a deeper view of the ritual practices, demography and social structures in order to investigate the social background and the cultural processes involved in the complex Baltic protohistoric experience.

05 THE THING BEFORE THE VIKING AGE. EXPLORING COLLECTIVE IDENTITY THROUGH COOKING PIT SITES

Author: Dr Ødegaard, Marie - Museum of Cultural History University of Oslo (Presenting author)
Keywords: Cooking-pits, assemblies, governance
Presentation Preference: Oral

This paper will investigate archaeological traces of large-scale gatherings from the Roman Iron Age and Migration Period (AD-1-600) in Scandinavia, so-called specialized cooking pit sites. While known over large geographical areas reaching as far as northern Germany, South-Scandinavia and southeast Norway these sites are relatively rare. In the last decade, large cooking pit sites have been interpreted as remains of assembly sites (Old Norse thing). The thing was one the most basic institutions of the Germanic peoples, however, first known in Scandinavia from written sources from the late Viking age. Less to nothing is known about the thing in the previous periods. The cooking pit sites go out of use in the 7th century, corresponding to several large-scale social changes in Northern Europe. Focusing on sites from eastern Norway, this paper aim to explore if cooking pit sites are traces of early thing sites, and what the sites can reveal about collective identity and systems of governance in the pre-Viking age.

06 NORTH-WEST OF RUSSIA IN THE EARLY MIDDLE AGES: SETTLEMENT AROUND THE LAKES

Author: Mikhaylova, Elena - Saint Petersburg State University (Presenting author)
Keywords: long barrows culture
Presentation Preference: Poster

The early Middle Ages in the north-west of the Russia were studied mainly by funerary sites. Researchers proceed from the assumption that each burial ground is a cemetery of the corresponding settlement and the location of the cemeteries corresponds to the location of ancient settlements.
One of the most notable cultures in the Russian North-West is the Pskov long barrows culture (PLBC), distributed from Estonia to the Volga tributaries and dated from the end of the 5th century up to 10–11 centuries. The cemeteries of the PLBC are located on the banks of small rivers and the shores of lakes, usually on elevated areas covered with pine forest. An arrangement of the burial grounds aroused the hypothesis that the corresponding settlements were located on dry sandy soils, and the basis of their farming was the slash-and-burn agriculture.
The accumulation of information prompts a revision of the old views. The discovered settlements of this culture are usually associated with the shores of lakes and located by the water. The mapping of well-studied areas established a stable system of ancient settlement near shores. The settlements and their immediate economic zones were located directly by the water and were turned towards the lake. In the forest zone, the water surface was a natural way from the village to the village, a kind of common yard. Thus, the daily life was concentrated along the shores, and only the cemeteries are associated with the high sand areas and, consequently, their location describes not the type of economy, but rather world view of the ancient population. The main types of economic activity were probably connected not only with forest areas, but also with the lake floodplains and waters. Indirect confirmation of this is provided by today's data on the farming of PLBC.

07 THE MIGRATION PERIOD BETWEEN ODRA AND VISTULA: NEW SOURCES, NEW IDEAS

Author: Prof. Bursche, Aleksander - University of Warsaw
Co-Author: Zapolska, Anna - University of Warsaw (Presenting author)
Keywords: Barbarian, coins, imitations
Presentation Preference: Oral

Brief results of the 5-year Project "Migration Period between Odra and Vistula" (cf. www.mpov.uw.edu.pl) realised by the international team will be presented in the context of new archeological and natural sciences data including pollen, radiocarbon, DNA and isotopic analysis.
The transfer of technology from the late Roman Empire to Barbaricum and political conflicts were the main reasons and mechanisms of the migration to the South – to the Western Roman Empire and back North – to Scandinavia.
New sources from central and northern Poland confirm the continuity of settlement activity of elite character in so-called central places, emporia, logistic and power centers, evidently of Germanic character, until 7th c. AD. It is safe to conclude that there was some Germanic-Slavonic coexistence, which would explain ia, the continuity of the use of hydronyms, eg, Vistula.

In the light of the most recent results we need to recognize the existence of a relatively brief hiatus from mid 7th until end of 8th century AD, when the first Scandinavian material is observed once again on the southern Baltic coast. Perhaps this is evidence of the survival in the memory of the elites in the North (runes, sagas) of ties linking the inhabitants of Scandinavia with the regions of the Dnieper river in Ukraine via the lower Vistula region. This could be a good explanation of the one of the most important directions of Varangians expansions on the European mainland.

132 COLLECTING ROCKS FOR SCIENCE! BUILDING BRIDGES AND HOW TO SUCCESSFULLY IMPLEMENT CITIZEN SCIENCE FOR MIDDLE PALAEOLITHIC SURVEYING ACROSS NORTHERN EURASIA

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Kellberg, Trine (Denmark) - Aarhus University
Co-Author(s): Nieuwenkamp, Robin (Netherlands) - Dutch Ministry of Education, Culture and Science
Keywords: Citizen science, surveys, Middle Palaeolithic
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The potential of citizen science for archaeological surveys is irrefutable, however, also connected to a number of challenges. These include challenges with specialised training, and the lack thereof, in regards to e.g. lithic recognition, geological prospection and registration procedures. Another dimension of challenges is related to the management of positive communication between stakeholders and participants in order to ensure a mutual beneficial relationship. In order to successfully implement citizen science for survey purposes, these matters needs to be addressed at a local scale. However, these local survey schemes and their results are also extremely relevant to largescale pan-Eurasian archaeological research questions, such as, for example, understanding hominin distribution and habitat selection. This session wish to address and discuss 1) the cost-benefit of engaging the public in citizen science survey schemes, 2) the best procedures to ensure a successful outcome of such surveys and 3) the way in which we promote pan-Eurasian archaeological collaboration and knowledge-sharing in order to ensure that these surveys are not merely local treasure hunts, but instead become broadly relevant. The main temporal and spatial frame is the Middle Palaeolithic (MP) across the northern rim of the hominin range from Britain to Russia (~50-55°N). This focus is driven by particular problems with recognition of MP sites in this area because of e.g. repeated glaciations and secondary deposition of sediments. Also, it is a historically charged topic since the search for e.g. handaxes goes back to the dawn of archaeological practise here.

01 A DANISH PERSPECTIVE ON MIDDLE PALAEOLITHIC SURVEYING AND PUBLIC ENGAGEMENT

Author: PhD Kellberg Nielsen, Trine - Aarhus University (Presenting author)
Keywords: Denmark, survey, engagement
Presentation Preference: Oral

Denmark does not currently have secure finds from the Middle Palaeolithic. A number of surface finds have been proposed a Middle Palaeolithic age based on typology, but none have chronostratigraphic information supporting the interpretation. Most of these finds were made historically by amateur archaeologists, and today, the search for Middle Palaeolithic artefacts is undertaken by very few isolated amateur- and professional archaeologists without a principal strategy or guideline. This talk will 1) present the geohistorical challenges associated with the case-study area and discuss its influence on the reliability of the existing empirical record, 2) identify suitable geographic- and temporal foci for prospective survey schemes and 3) discuss the cost-benefits of public engagement, e.g. through amateur archaeologist networks and public outreach.

02 'NO STONE SHALL BE LEFT UNTURNED': A REFLECTION ON A DECADE OF SURVEYING FOR NEANDERTHAL-ARTEFACTS IN THE NORTHERN NETHERLANDS

Author: Drs. niekus, marcel j.l.th. - Stichting STONE / Foundation for Stone Age research in the Netherlands (Presenting author)
Keywords: Palaeolithic, survey, volunteers
Presentation Preference: Oral

Late 2006 a survey project was initiated by the Groningen Institute of Archaeology and the Drents Museum. The project, which is currently directed by the Stone Foundation, was aimed at discovering Middle Palaeolithic surface scatters on the glacial soils of the Drenthe-Frisian till plateau in the northern part of the Netherlands. These surveys are undertaken mostly by amateur-archaeologists in close cooperation with professional archaeologists and occasionally students and other volunteers. During one of these surveys a Middle Palaeolithic artefact scatter was discovered, the first Neanderthal campsite from the region, and one of the most northern Neanderthal-sites in NW-Europe. Hitherto only isolated finds and a few very small scatters were known. Over the years hundreds of Middle Palaeolithic artefacts were discovered during these extensive and systematic surveys, not only from the site mentioned above but from other locations along the same stream valley as well. During the presentation the project as well as the results will be discussed, in addition to problems regarding lithic recognition in relation to post-depositional surface modifications, the registration procedures, geological research, contacts with farmers, the press, popular-scientific output etc.

134 EXPLORING THE SPATIAL AND TEMPORAL SCALES OF WARFARE AND CONFLICT

Theme: 6. Interpreting the archaeological record
Author: van der Schriek, Max (Netherlands) - Vrije Universiteit Amsterdam
Co-Author(s): Roymans, Nico (Netherlands) - Vrije Universiteit AmsterdamSymonds, James (Netherlands) - Universiteit van AmsterdamBurmeister, Stefan (Germany) - Museum und Park Kalkriese
Keywords: Conflict archaeology, Landscape archaeology, warfare
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Conflict archaeology is a new and promising field of research which has developed rapidly over the past two decades. This distinctive branch of archaeology focuses on the material manifestations of human violence from prehistory to the 21st century. The wider spatial and temporal dimensions of warfare and conflict, however, appear to be relatively underexplored themes; most research is site-based and related to a specific period or conflict.
The goal of this session is to explore the advances in conflict archaeology by a consideration of the wider scales of analysis in a spatial as well as a temporal sense. Where are the edges of conflicts and wars? How essential is the availability of historical sources? How can we study long-term trends? A consideration of 'conflict landscapes' might serve to re-focus work away from individual battles to explore the interrelationship between different spatial elements. Landscapes of conflict consist of more than just battlefields, but also include military encampments, airfields, practice areas, ammunition depots, and crucially, civilian settlements. There is also a need to explore long-term developments that cross-cut traditional chronological boundaries around themes like 'warfare and ritual', combat strategies, post-battle activities at conflict sites, the impact of warfare on rural communities, and the issue of warfare and migration.
The objective of this session is to offer:
Case studies that focus on landscapes of conflict.
Case studies that explore long-term developments in warfare and collective violence.
Studies exploring the potentials and limitations of new methodologies and techniques with regard to the above themes.

01 EXPLORING THE SPATIAL AND TEMPORAL SCALES OF WARFARE AND CONFLICT

Author: Van der Schriek, Max - (Presenting author)
Keywords: Petroglyphs, intentionality, hunting
Presentation Preference: Oral

Conflict archaeology is a new and promising field of research which has developed rapidly over the past two decades. This distinctive branch of archaeology focuses on the material manifestations of human violence from prehistory to the 21st century. The wider spatial and temporal dimensions of warfare and conflict, however, appear to be relatively underexplored themes; most research is site-based and related to a specific period or conflict. The goal of this session is to explore the advances in conflict archaeology by a consideration of the wider scales of analysis in a spatial as well as a temporal sense. Where are the edges of conflicts and wars? How essential is the availability of historical sources? How can we study long-term trends? A consideration of 'conflict landscapes' might serve to re-focus work away from individual battles to explore the interrelationship between different spatial elements. Landscapes of conflict consist of more than just battlefields, but also include military encampments, airfields, practice areas, ammunition depots, and crucially, civilian settlements. There is a need, however, to explore long-term developments that cross-cut traditional chronological boundaries around themes like 'warfare and ritual', combat strategies, post-battle activities at conflict sites, the impact of warfare on rural communities, and the issue of warfare and migration. The objective of this session is to offer: • Case studies that focus on landscapes of conflict. • Case studies that explore long-term developments in warfare and collective violence. • Studies exploring the potentials and limitations of new methodologies and techniques with regard to the above themes.

02 SOME LONG-TERM OBSERVATIONS ON INFANTRY WARFARE IN EUROPE FROM LATE PREHISTORY TO THE 19TH CENTURY

Author: Professor Dr Roymans, Nico - Vrije Universiteit Amsterdam (Presenting author)
Keywords: warfare, long-term developments
Presentation Preference: Oral

Changing methods of warfare and military organisation are the traditional domain of military history. However, archaeology increasingly starts to manifest itself in this specific field by studying weaponry, army camps, battle sites, massacre deposits, etc.. Archaeology can provide an original contribution to this domain by enlarging the time depth and analysing long-term patterns from the prehistoric period onwards. In this paper I will focus on the long-term development of infantry warfare in Europe. I will start with discussing the results of the recent excavations of the Bronze Age battlefield of Tollense Valley (northern Germany) and will end with thoughts on the spatial organisation of Napoleonic-style army camps. Central questions that will be discussed are: How can we characterize the type of warfare practised in the NW European Bronze Age? Is there a link with Homeric style warfare in ancient Greece as documented in the written sources? Does the archaeological evidence collected at Hjortspring, Ribemont and La Tène indicate the introduction of a new style of warfare in the pre-Roman Iron Age based on warbands fighting in close linear formations? If so, can we relate this development to the introduction of phalanx warfare in Greece from the early 1st millennium BC onwards, as suggested earlier by Randsborg (1995)? I will argue that infantry warfare in close battle lines – be it in all kinds of variations - remained a dominant tradition throughout the Roman period, the Middle Ages and the pre-modern era, and reached its climax in the Napoleonic period. In the mid-19th century this style of combat rapidly disappeared as a consequence of the diffusion of industrial warfare.

03 THE SIGNIFICANCE OF SWORD IN THE BRONZE AGE SOCIETIES IN BOHEMIA

Author: Dr Kristuf, Petr - University of West Bohemia in Pilsen (Presenting author)
Co-Author: Ms Havlikova, Marketa - University of West Bohemia in Pilsen
Keywords: sword, Bronze Age
Presentation Preference: Poster

The poster focuses on the issue of prehistoric warfare and significance sword in the Bronze Age in Bohemia. Warfare has been an important part of past communities and it is important to pay attention to this theme in archaeology. The main question is, what the sword meant in the prehistoric society, and what was his practical function. To achieve this it is necessary to take a close-up look at combat, weapons and fighters as elementary parts of warfare. This paper focuses on the complex research of bronze swords and their practical use in combat. One way is use-wear analysis of prehistoric weapons. We studied 41 Bronze Age swords from Bohemia and applied use-wear analysis. We carried a macroscopic analysis out and identified more than 280 different traces of damage. We selected swords with these damages for microscopic and X-ray analysis. By combining

various methods we are able to identify and document various interventions in metal, which indicate different use of the sword in battle. Moreover, X-ray analysis showed possible casting process and especially low quality of some blades. This indicates that these swords could not be practically used because they could not withstand repeated collisions.

04 VIOLENT POST BATTLE PROCESSES AS PSYCHOLOGICAL COPING STRATEGIES OF TRAUMATIC WAR EXPERIENCES?

Author: Burmeister, Stefan - Museum und Park Kalkriese (Presenting author)
Keywords: post-battle-processes, violence, psychology
Presentation Preference: Oral

After the phase of the actual military violence, a second phase of violence begins. A phase in which the victors vent themselves on the losers. This phase is in its intensity of cruelty and violence in no way inferior to the first phase. Written and iconographic evidence as well as the archaeological record insistently show, that atrocities were an integral part of ancient warfare. The victor had unlimited power over the loser, who was hopelessly at his mercy and was a target of his offensive violence. But why this delimited violence was so omnipresent and seemingly self-evident remains unclear.
Through the work of the US psychiatrist Jonathan Shay with Vietnam veterans, posttraumatic stress disorder has found its way into the historical discourse to explain violence in ancient warfare. There are, however, numerous factors why modern war experiences do not parallel pre-modern experiences – and posttraumatic stress disorder are only of limited potential for explaining violence in antiquity. Especially for bellicose societies, the concept of appetitive violence, as discussed most recently with regard to combatants of intra-African conflicts, seems to provide a more appropriate model for warrior cruelties.
Numerous archaeological finds add a further facet to the ancient phenomena of violence: the ritual violence after battle, which show a planned and structured procedure. It served to reduce the high emotional intensity of war experiences and to downsize them to a normal level. The post-battle processes were a mechanism to adapt warriors again to civil life in a bellicose society – and to prepare mentally for the next war.

05 NEW BURIAL SITE OF GOLDEN HORDE COMBAT IN CENTRAL KAZAKHSTAN: DIVERSE LANDSCAPE OF CONFLICTS AT THE BULANTY

Author: Senior Fellow USMANOVA, EMMA - Buketov Karaganda State University, Saryarka Archaeological Institute (Presenting author)
Co-Author: Associate Research Professor Panyushkina, Irina - Laboratory of Tree-Ring Research, University of Arizona
Keywords: Radiocarbon, Golden Horde
Presentation Preference: Poster

The Karasyur site is the burial site of small combat group fallen in a battle at the mid 13th Century in the heart of the Golden Horde (Jochi Ulus) during the Fall of Mongol Empire. The site was accidently discovered at the Bulanty Battle field, which is dated to 1727 and represents the pinnacle of Kazakhs' resistance against the aggression of Dzungars (Kazakhstan, Karaganda oblast, Ulytau area, 47°10′ N 65°30′ E). Five burial structures are 4-5 m long, 2 m wide and 0.5- 0.7 m high in the size. Each pit has interment of a single human skeleton. The skeletons are young adult males, three of which are the Mongoloid (burials 1-3) and one is Caucasian race (burial 5). Three mongoloid males had rich weaponry including birch bark quivers with sets of arrows, iron knives, iron hooks and iron flints. Burial 1 had fragments of plated armor and sheep blade for divination near the skull. Caucasian male from the burial 5 had no weaponry objects but evidences of involuntary captivity. Worrier from the burial 1 had the highest status in the group. The burials had several sheep bones placed randomly in the pit that consistent with the Mongolian rite of funeral offerings. Burial 1 and 2 include objects of Buddhist custom such as a carved image of Buddha and a Buddhist metal bell. Radiocarbon dates the cemetery to the interval cal AD 1220-1260 (1σ). This is the first C-14 dating of the Golden Horde in Kazakhstan, and the site of Buddhist militants in the Golden Horde. The Golden Horde warfare is poorly explored at the northern margins of Eurasia Steppe. We discuss the broader context and finer scale of Mongol warfare and address to problem of the traditional chronology of warfare across the landscape of conflicts in Central Kazakhstan.

06 DEFEND IN DEPTH OR NOT: DIFFERING APPROACHES TO THE DEFENCE OF THE ISLE OF MAN BETWEEN THE 16TH -19TH CENTURIES

Author: Mr Johnson, Andrew - Manx National Heritage (Presenting author)
Keywords: landscape, strategy, artillery
Presentation Preference: Oral

Defensive strategy constantly evolves in the face of changing tactics of attack and improving technology. A small island, however, is always vulnerable to attack because of the limited means of achieving defence in depth. This is true of the Isle of Man, a small, 580 square kilometre island in the centre of the British islands which at various times has been seen as a means of controlling the Irish Sea, and at others as a vulnerable stepping stone towards the invasion of England.

Its varied 160-kilometre coastline bears witness to numerous responses to potentially unfriendly visitors through thousands of years, ranging from prominently positioned prehistoric monuments designed in part to indicate proprietary ownership, through Iron Age promontory fortifications and Viking watch and ward stations, to WW2 radar stations and airfields.

Within this wider timeframe the period between the 16th and 19th centuries saw varied responses to the differing threats of naval gunnery and invasion forces with a field artillery capability.

Initially, a small number of stone forts provided direct protection for ports. Later, continuing growth in the power of cannon was reflected in the extension or modernisation of existing stone defences and the construction of new earthen fortifications designed to defend the island in depth against invading forces during civil war in the 17th century.

Subsequently the approach to defence reverted to the coastline, but was now more diffuse and aimed at also protecting settlements and anchorages. Stone fortifications were partially abandoned in favour of small batteries of cannon protected by earthen ramparts, the characteristics of which are now becoming apparent through new research and survey. Finally, the continued development of naval gunnery in the 19th century meant that the defence of the British islands could only be secured in turn by the massive expansion of the British Royal Navy.

07 DESERTED VILLAGES IN BOHEMIA AS AN EVIDENCE OF THE THIRTY YEARS´ WAR IMPACT ON LOCAL POPULATIONS

Author: Doc PhDr Vařeka, Pavel - Západočeské univerzity v Plzni (Presenting author)
Co-Author: Professor Dr Symonds, James - University of Amsterdam
Keywords: Thirty Years' War
Presentation Preference: Oral

The Thirty Years´ War, as with other more recent modern wars, affected the entire landscape, especially areas close to the routes used by marching armies. The most typical form of non-combat conflict is represented by everyday contact between soldiers and local populations. This was regularly characterized by looting and pillage, accompanied in many cases by burning of houses or entire settlements, and was in many ways an intentional part of the strategy of the army at a time when military logistical support was absent. All of the above activities are well documented in written records, but we might wonder whether such fleeting acts of theft and aggression left any material traces in the afflicted rural settlements? Recent research in Bohemia on villages which were deserted during the Thirty Years' War has recovered archaeological traces of the harrying of the countryside. Fire destruction horizons capture a moment in time and offer examples of 'stopped life' that provide evidence of specific moments in time, but also about the conditions of everyday life of peasants during the war. Research into deserted villages in western and central Bohemia has shown great potential for the study of the impact of the Thirty Years´ War on rural settlements and has demonstrated the heavy burden that peasants had to bear. Our investigations have been undertaken to broaden the scope of conflict archaeology, taking a more holistic view of the conflict that encompasses both the landscapes of settlement as well as the fields of conflict. At a macro-level our investigations have high-lighted how the passage of large numbers of poorly provisioned mercenaries can devastate settlements and create corridors of total destruction. At a micro-level our investigations have revealed the brutality that was unleashed upon individual households and villages.

08 THE CONSTRUCTION OF A FORTIFIED FRONTIER LANDSCAPE DURING THE PORTUGUESE RESTORATION WAR (1640-1668). METHODOLOGICAL PROPOSAL AND THEORETICAL MODEL

Author: Miss Blanco-Rotea, Rebeca - Santiago de Compostela University (Spain); Minho University (Portugal) (Presenting author)
Keywords: LandscapeArchaeology, ModernAge, Spanish-PortugueseWar
Presentation Preference: Oral

In 1580, Felipe II annexionated the Kingdom of Portugal to the Hispanic Empire, due to a succession crisis. After some intern conflicts, in 1640 a revolt took place in Portugal, resulting in the Duke of Braganza's proclamation as King João IV which started the Portuguese Restoration War (1640-1668).
The reinforcement of the Hispanic-Portuguese frontier was one of the first military actions that took place, in order to renovate the old medieval fortifications to adapt them to the new Art of war and the new strategies. The conflict brought about the complete transformation of the old mediaeval defences between both countries, leading to the construction of bastioned fortifications, especially campaign fortifications. This new fortified landscaped maximized the defensive possibilities of the territory through the implementation of the bastioned fortifications developed by military literature during the XVI, XVII and XVIII centuries.
The aim of this presentation is to provide a general view on how to study a fortified landscape of the Modern Age, combining a symbiotic perspective based on Archaeology of Architecture and Landscape Archaeology. Different techniques such as remote sensing, archaeological and architectonical survey, documental analysis, spatial and perception analysis, were deployed in order to achieve an interdisciplinary knowledge on the study of this particular landscape. This methodological proposal, tried out in the northwestern section of the frontier between Spain and Portugal, known as Raia Húmida, culminates in a theoretical model for the interpretation of frontier fortified landscape.

09 THE OCCUPATIONSCAPE: UNDERSTANDING LONG TERM TRENDS IN LANDSCAPES OF MILITARY OCCUPATION

Author: Dr Carr, Gilly - University of Cambridge (Presenting author)
Keywords: Occupationscape, activism, Channel-Islands
Presentation Preference: Oral

This paper offers a methodology for understanding long-term trends in landscapes which have experienced military occupation. Drawing on both 'legacy landscapes' (bearing an aftermath of conflict not yet turned into heritage) and 'heritage landscapes' in the Channel Islands as a case study, this paper shows how changing narratives of occupation over time have dictated which elements in the landscape have been identified as sites of memory and selected for heritage inclusion, and which have been allowed to become covered in the undergrowth and hidden from sight, both literally and metaphorically. As this has changed through time, especially through the recent activism of the author, this paper discusses how occupationscapes can potentially be manipulated or shaped through the role of various actors. This paper also proposes that official and popular occupationscapes can co-exist in tension / harmony with each other, affecting how local people and tourists experience and read the landscape, which can exacerbate or calm local memory wars. Finally, this paper observes how occupationscapes can be entirely personal, familial or community-based, and can be selected / created as part of individual or group identity construction.

10 AN OCCURENCE AT VOSSENACK RIDGE: READING 'HIDDEN' BATTLEFIELDS OF MODERN WARFARE AS CONFLICT LANDSCAPES

Author: Prof. Dr. Rass, Christoph - University of Osnabrueck (Presenting author)
Keywords: conflict_landscapes, interdisciplinary_research,
Presentation Preference: Oral

In November 1944 US-American and German troops clashed over three villages in the Eifel Mountains south of Aachen. An Operation planned as a quick strike ended in bitter defeat for an American Infantry Division after several days of hard fighting. At the center of the its advance, an infantry battalion was deployed to guard a forward leaning hill slope which became a battlefield for just over a week before the war moved on. Today there are no visible traces of the events which became an important scene in the narrative of a military disaster. A University of Osnabrück team of Historians, Archeologists, Geographers and Cultural Scientists [www.konfliktlandschaften.org] has set out in a series of campaigns since 2013 to study the site, called 'Vossenack Ridge' by the Americans from an interdisciplinary perspective. It aims to integrate conventional process generated sources, archaeological findings, magnetometric evidence, narratives and memorials as well as specific post-battle processes into a GIS-based, multi layered network which facilitates a reconstruction of events as well as an understanding of their different reflections through various kinds of evidence often used disconnected rather than in dialog. Designed as a methodological exercise to foster interdisciplinary conflict landscape studies, the study will also shed some new light on a small but significant piece of World War II military history. All in all it contributes to our understanding of those modern day battlefields which often 'quickly' disappear in the absence of heavy earthworks, bunkers and enduring artillery bombardment. The proposed talk will concentrate on three key aspects of our research: (a) developing a model of conflict landscapes integrating their

temporal and special dimensions as well as their material and discursive production; (b) integrating diverse data into an analytical framework operationalizing that model; (c) an exemplary discussion of findings derived from this line of work.

11 DUTCH TWENTIETH CENTURY LANDSCAPES OF CONFLICT. THE IMPLEMENTATION OF LIDAR-BASED DIGITAL ELEVATION MODELS.

Author: Mr VAN DER SCHRIEK, Max - Vrije Universiteit Amsterdam (Presenting author)
Keywords: LiDAR, Conflict Archaeology
Presentation Preference: Oral

The prospection and evaluation of World War II (WWII) related conflict sites in the Netherlands poses archaeologists for specific challenges. Large-scale excavation campaigns of these conflict landscapes are problematic due to the (possible) presence of human remains and live ammunition. Digital Elevation Models (DEMs), derived from LiDAR-data, can be very useful to map archaeological sites in order to get a better overview of what is left and how these remains should be protected and researched further.

Airborne Laser Scanning or Light Detecting And Ranging (LiDAR) is quite a new technique for most archaeologists. By means of LiDAR-based DEMs it is possible to make an indication of both the archaeological and the heritage value of a conflict site. The first results showed that some forests and heathlands conceal a well preserved landscape of non-hardened military structures, features of which the heritage value is hardly investigated.

The principle aim of my research is to retrieve, assess and interpret the gathered archaeological information related to WWII. A desk-based survey by means of DEMs makes it possible to target archaeological fieldwork carefully since the detected features can be precisely located. In best practice, the detected features will not only be mapped, but will also be compared with and connected to existing historical, archaeological and environmental data.

The analysis of LiDAR-based DEMs is contributing extensively to the detection and evaluation of archaeological sites in general and to WWII conflicts sites in particular. DEMs can be very useful for landscape studies and to better understand conflict sites. During this presentation I will show the benefits and drawbacks when applying this technique in the Netherlands.

12 TERRORSCAPES AS HETEROTOPIAS

Author: Kolen, Jan - Faculty of Archaeology, Leiden University (Presenting author)
Co-Author: Kolen, Jan - Leiden University
Keywords: Terrorscapes, Heterotopia, materiality
Presentation Preference: Oral

Over the past two decades archaeologists have discovered the 20th-century sites of trauma and terror in Europe as a new field of archaeological interest and public dialogue. Although research initially concentrated on the hotspots of conflict, trauma and terror, such as the concentration camps from the Second World War, the perspective has now shifted towards their wider spatial and material contexts. Notable examples are the archaeological projects and surveys at Treblinka, Auschwitz and Westerbork and on the Channel Islands, where the research focuses on the archaeology of whole "terrorscapes" and their postwar transformation into highly valued landscapes of memory. Through the archaeological focus on the relationships between the spatial, material and ideological, these projects significantly contribute to the realization that terrorscapes were designed and used as spatial technologies for exercising terrorism in active ways, not only practically and physically but also symbolically. Yet, although the new terminology explicitly links the former spatial organization of terror to the notion of landscape, spaces of terror are not easily understood from a conventional landscape perspective. Alternatively, this paper explores sites of terror and their archaeological dimensions as "heterotopias", the geographical concept coined by Foucault for non-hegemonic spaces that cannot be classified easily in terms of here and there, public and private, self and other. Viewed from this alternative perspective, the former concentration camps were part of large-scale spatial structures that connected order to ambiguity, liminality and inversion – a process in which arrangements of material culture played a significant role.

13 A DESERT TRANSFORMED BY THE WORKS OF WAR: AN ARCHAEOLOGY OF THE WESTERN SAHARA CONFLICT 1975-1991

Author: Dr Garfi, Salvatore - University of Nottingham (Presenting author)
Keywords: Conflict, Landscape, Colonialism
Presentation Preference: Oral

When Spain gave up its colony of Spanish (now Western) Sahara in 1975, it was annexed by Morocco and Mauritania. A sixteen-year war ensued, leaving the country divided between Morocco and the Polisario Front. This unresolved conflict left indelible scars on the landscape: battlescapes, made up of numerous field fortifications littered with the detritus of war, and most strikingly 'the berm' (or 'berms') a succession of around 4000 kilometres of fortified earth and stone walls constructed by Morocco between 1980 and 1987, partitioning the desert and excluding pro-independence Saharawis from four-fifths of their country.

This paper will explore how this desert landscape has been transformed by colonialism and war, and how in some ways, the Saharawi people are actively re-appropriating their land. This will be done by looking at the landscape at three levels of resolution. The broadest, or national level, charts the growth and spread of the berms, illustrating the material extent of Moroccan colonial control, and the exclusion of Saharawis within and outside the territory. The middle, or regional level, explores the militarisation of one settlement – Tifariti – which was fought over during the war, and which hosted a unique art festival between 2007 and 2010. The third, finer level, will look at the land art that was created as a result of the art festival, and which is now a new stratum of contemporary archaeology, overlying the extensive prehistoric archaeology evident in the region.

A great number of national barriers are at this moment being raised around the globe, with countries adopting siege mentalities with their neighbours. This presentation will illustrate how archaeology can apply a multi-disciplinary approach, drawing upon a variety of resources, to help us understand territory-wide conflict through the unique example of Western Sahara.

135 CONTEXTUALISING THE DEAD

Theme: 6. Interpreting the archaeological record
Author: Gerdau, Karina (United Kingdom) - Bournemouth University
Co-Author(s): Gale, John (United Kingdom) - Bournemouth UniversityHerrera, Alexander (Colombia) - Universidad de los Andes
Keywords: Funerary, cemetery, mortuary, death, beliefs
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The discovery and investigation of the dead is a rich vein of data that has been mined intensively by archaeologists and anthropologists over the last two centuries on an increasingly global scale. For many pre-historic societies the dead and the artefacts, monuments, sites, and landscapes to which they are inextricably linked can be the sole or predominant representation of cultures that are now at best only partially understood. The increasing specialization within the associated disciplines of archaeology, anthropology, and sociology inevitably lead to the intensification and diversification of knowledge that make the synthesis of such information into enveloping cultural narratives complex and challenging.
This conference session seeks to bring together researchers from such specialisms who work on mortuary practices, beliefs, and associated remains, monumentality, and landscapes to facilitate wider scholarly debate on their work. We will be pursuing two principal themes focusing on the relationship between (1) the living and the dead and between (2) deathscapes and cosmologies, and how these may be studied and interpreted archaeologically. We would like to showcase current best practice, theoretical underpinnings, and methodological approaches that deepen understandings of past societies through contextual study of the materiality of death.

01 KEEPING THE DEAD CLOSE: CONTINUING BONDS, PAST AND PRESENT

Author: Dr Croucher, Karina - University of Bradford (Presenting author)
Co-Author: Dr Büster, Lindsey - University of Bradford; Dr Dayes, Jennifer - University of Bradford; Prof Faull, Christina - LOROS; Green, Laura - University of Bradford
Keywords: Mortuary archaeology
Presentation Preference: Oral

This paper explores how sociological theories of grief and mourning are impacting on the interpretation of funerary archaeology. In particular, the plastered skulls of the Neolithic Near East are examined in light of concepts of bereavement, in contrast to previous archaeological interpretations which have suggested their roles in negotiations of status, hierarchy and power. Instead, the remains may be indicative of a desire to keep the dead close for longer. In addition, the present is informed through the past, as the 'Continuing Bonds' project explores how case studies from archaeology and anthropology detailing fascinating ways of dealing with the dead can inform attitudes, values and beliefs around death and dying today.

02 DEAD BODY MANAGEMENT AND SITE FUNCTION(S): WHAT INTERACTIONS?

Author: Zemour, Aurélie - Ausonius UMR 5607 LabExSciences archéologiques de Bordeaux; Université Côte d'Azur, Nice, France; CNRS CEPAM UMR 7264; Università degli studi di Roma « La Sapienza » (Presenting author)
Co-Author: Binder, Didier - Université Côte d'Azur, Nice, France; CNRS CEPAM UMR 7264; Coppa, Alfredo - Università degli studi di Roma « La Sapienza »; Duday, Henri - UMR 5199 PACEA, Université de Bordeaux
Keywords: burials site function
Presentation Preference: Oral

One of the specificities of the first farmers living in Italy and in southern France at the dawn of the Neolithic is to be both residential and mobile. The role of the funerary system within this lifestyle has never been questioned. For a long time, early Neolithic burial practices in the northwestern Mediterranean region were thought to be highly uniform, consisting of primary burials in caves used foremost for domestic activities.
An archaeothanatological approach mobilizing a broad panel of archaeological testimonies consisting of 45 sites and 87 funerary units invalidated this perception.
This approach revealed a multiplicity of funeral practices and shed light on the role occupied by the funerary system within the multifaceted complementarity between sites.
Depositional contexts (open air sites and cavities) are as diverse as the spatial locations of the burials in the sites. Deposition places can be divided at least into two main categories: those with a strictly funeral function and those where the funerary vocation is combined with domestic or economical activities.

03 VILLAGE OF THE DEAD AND VILLAGE OF THE LIVING: ROCK-CUT TOMB LANDSCAPES IN ETHNOGRAPHIC SULAWESI AND LATE NEOLITHIC SARDINIA

Author: Dr Robin, Guillaume - University of Edinburgh (UK) (Presenting author)
Co-Author: Dr Adams, Ron - Simon Fraser University (Canada); Dr Soula, Florian - Aix-Marseille University (France)
Keywords: Ethno-archaeology, landscape, death
Presentation Preference: Oral

Rock-cut tombs are emblematic prehistoric monuments in Europe. In Sardinia (Italy), Late Neolithic landscapes are full of these underground chambers that were used over generations for collective burials. Some tombs were decorated to resemble house interiors, and cemeteries are often referred to as villages of the dead. One of the main challenges today is the elusive nature of associated settlements, which hinder our assessment of the relationships between the living and the dead, and the role and the social life of the dead within Neolithic village communities.

Why were the dead placed in cemeteries of rock graves that looked like houses? Did Neolithic villagers live nearby or far away from these monumental cemeteries? How often did they visit their ancestors? Did landscape features play a role in shaping these relationships?

One way to address these questions is to explore ethnographic parallels. Rock-cut tombs are still a living tradition in the Indonesian island of Sulawesi, in particular among the Toraja who are also famous ethnographically for their elaborate death rituals and ostentatious village houses. This paper will present the first results of an ethno-archaeological project in Sulawesi which explores the role of the landscape in framing social relationships between village communities and their ancestors. It will also discuss how such ethno-archaeological fieldwork can inform our approach to the survey of prehistoric rock-cut tomb landscapes in Sardinia.

04 WITHOUT CEMETERIES. DIVERSITY OF MORTUARY PRACTICES FROM THE 6–5TH MILLENNIUM BC IN EASTERN HUNGARY

Author: Dr Anders, Alexandra - Eotvos Lorand University (Presenting author)
Keywords: Neolithic, Hungary, burials
Presentation Preference: Oral

The burials of the Late Neolithic period (6–5th millennium BC) did not form separate cemeteries, they have been unearthed within settlements, usually in relation to houses. The mortuary practices within a given frame could be very different, even in the case of a single site. The paper will focus on the following questions: What was the connection between the burials and the settlement – which part(s) of the latter was used for interment? Who were buried – females, males, children, outstanding personalities, or ordinary people? Where were they buried – in proper graves, in pits, in postholes? How were they buried – in parts or wholes? What was the connection between the living and the dead – are there any traces of manipulation before and after the funeral? How many grave goods were placed in the grave – nothing, or a great amount? Are there connections between the dead and the iconography of the figurines? Can we find any explanation for this diversity in the mortuary practices? The burials under discussion were excavated in Polgár-Csőszhalom, Polgár.Ferenci-hát, Berettyóújfalu-Herpály, Öcsöd-Kováshalom, and Aszód-Papiföldek.

05 BLURRED GENDERS IN THE MIDDLE AND LATE IRON AGE CHILD BURIALS IN LATVIA

Author: Ms Vilka, Aija - Institute of Latvian History at the University of Latvia (Presenting author)
Keywords: Children, gender, Latvia
Presentation Preference: Oral

Adults in the Middle and Late Iron Age (5th – 12th century) cemeteries in the territory of Latvia are usually accompanied by gendered grave goods, i.e. males are buried with weapons, females – with household objects and specific "female-type" ornaments. However, subadult burials sometimes can be gender neutral or even ornamented with mixed gender grave goods (e.g. boys' burials with typical male gender grave goods, as weapons and drinking horns mixed with beads necklaces, which is usually associated with female gender burials), suggesting that in some cases gender specifications in smaller children burials are blurred and children in living society probably could be perceived as a distinctive group. In this paper child burials from different local tribes' cemeteries will be analysed, showing distinctive approach to children gendering and outlining possible changes in children social roles based on their grave goods.

06 DEAD ONCE – BURIED TWICE. THE SECONDARY MANIPULATION OF THE BODY AFTER DEATH DURING NEOLITHIC AT THE LOWER DANUBE

Author: Kogalniceanu, Raluca - Vasile Parvan Institute of Archaeology Bucharest (Presenting author)
Co-Author: Simalcsik, Angela - Olga Necrasov Centre for Anthropological Research Iasi; Stefan, Cristian Eduard - Vasile Parvan Institute of Archaeology Bucharest
Keywords: death, secondary manipulations
Presentation Preference: Oral

The living bury the dead. The living manipulate the dead body ones, and sometimes twice or more times after death, based on their beliefs about the afterlife.
The secondary manipulation of the body after death during Neolithic at the Lower Danube is largely present, but less discussed. With some exceptions, the image that circulates in the literature is still that of "classical" burials, with the deceased laid down in a pit, accompanied or not by grave goods. Any additional or missing bone is still mostly regarded as an accident, rather than an intention. Some attention has been paid to skulls (or skull pieces) and mandibles found inside settlements or missing from graves.
The focus of our presentation is on a particularly intriguing situation, that of complexes of disarticulated bones found inside a Late Neolithic cemetery of the Hamangia culture (Cernavodă, Romania), sometimes side by side with "normal burials". The context and composition of some of these complexes are discussed, in an attempt to decipher their meaning, by answering questions such as: Whose bones are in these features? Were the bodies disarticulated immediately after death or some time after that? Have there been a selection of certain body parts? What else is there beside these disarticulated body parts? What can these complexes tell us about the beliefs that stood behind the action of disarticulating and recombining the bones/body parts? What is the place of this type of practices in the wider context of the Lower Danube during the Neolithic?

07 BORDERING THE SETTLEMENT? FUNERARY FEATURES AT THE MIDDLE BRONZE AGE SITE OF PIANU DE JOS (CENTRAL ROMANIA).

Author: Voicu, Madalina - National History Museum of Romania (Bucharest, Romania) (Presenting author)
Co-Author: Vasile, Gabriel - Vasile Pârvan Institute of Archaeology (Bucharest, Romania); Ilie, Marius - Trent & Peak Archaeology (Nottingham, UK)
Keywords: settlement, graves, inhumation
Presentation Preference: Oral

The main aim of this paper is to investigate the spatial relationship between the domestic features and the graves found inside the settlement at Pianu de Jos – Lunca Pârâului (Pianu de Jos village, Alba County, Romania). The Middle Bronze Age site was discovered in 2012 during the preventive archaeological campaign organized in view of motorway the constructions, part of the Pan-European Corridor IV (A1 Highway Orăștie – Sibiu, section 1 Orăștie - Sebeș). Excavations conducted on an area measuring 2.5 hectares have uncovered a habitation area (two rectangular surface dwellings, other ten possible semi-sunken circular dwellings and pits) and several funerary features (twelve inhumation and two cremation graves). The existence of settlement burials has often been understood in light of a symbolic relation between the dead and the living. The smaller percentage of overall Wietenberg inhumation graves as opposed to cremation graves has been used as additional evidence for this interpretation, especially given that inhumation graves appear to be favoured within the settlements. The Pianu de Jos – Lunca Pârâului site includes the most numerous inhumation graves documented so far within a Wietenberg settlement. At first glance, they seem to mark the limit of the living area towards south. A similar situation has been observed for a few other Wietenberg settlements with funerary features. By reviewing the results of the Ostheological analysis we will try to assess wheather this type of burial can be connected to specific age or sex groups. The subsequent data will be correlated with the particular funerary treatments as well as with the spatial analysis of the entire excavated area.

08 THE EVOLUTION OF A DEATHSCAPE IN LATER NEOLITHIC AND EARLY BRONZE AGE BRITAIN AND GETTING TO GRIPS WITH CONTEMPORARY COSMOLOGIES.

Author: Mr Gale, John - Bournemouth University (Presenting author)
Keywords: Deathscape, Henge, Barrows
Presentation Preference: Oral

The understanding of ceremonial and funerary landscapes of the later Neolithic and early Bronze Age in the UK and in particular southern England are dominated by the clustering of cemeteries around the larger henges. Sites such as Stonehenge, Avebury and Durrington Walls have long captured both academic and public interest and continue to offer new insights into their origins, purpose and inter connectivity. One of the lesser known sites, also found on the chalk-lands of southern England is the henge complex and associated barrow cemeteries in the Allen Valley of east Dorset. Periodic investigations since 1994 at the henge complex at Knowlton and at one of the three barrow cemeteries in this small river valley have revealed some surprising linkages with the natural landscape that have begin to suggest better understandings of the underlying cosmologies that underpin the use of space in this important corner of southern England. That subsequently such a number and range of monuments cluster at the site over as much as a millennium suggests a collective and long lasting social relationship between communities and a territorial homeland in which death and the ancestors were centre stage.

09 DO IRON AGE PIT BURIALS REPRESENT INDEPENDENT RITUALS OF SMALLER COMMUNITIES OR ARE THEY PART OF A LARGER PREHISTORIC IDEOLOGY?

Author: Ms Sperrevik, Janne - Bournemouth University
Co-Author: Mr Cheetham, Paul - Bournemouth University; Mr Evans, Damian - Bournemouth University; Dr Hambleton, Ellen - Bournemouth University; Mr Manley, Harry - Bournemouth University; Dr Russell, Miles - Bournemouth University; Dr Smith, Martin J. - Bournemouth University; Dr Gerdau, Karina - Bournemouth University (Presenting author)
Keywords: Durotriges, Burials
Presentation Preference: Oral

Burials in re-used storage pits occur across southern Britain during the Iron Age at a time when the majority of the population are disposed of through other means, such as excarnation. Yet, despite their widespread occurrence and the existence of similar burials across Continental Europe, they tend to be viewed as secondary burials and rarely undergo the same strict analysis that is common when encountering primary burials. The aim of this study was to determine whether Iron Age pit burials represent convenient body disposal, isolated rituals, or if they are part of a larger ideology. Primary osteological data was collected from twelve pit burials at Gussage All Saints and Winterborne Kingston, two Iron Age settlement sites in Dorset (UK). Using a combination of methods, six female and six male burials were identified representing three young, six middle and two old adults. Pathology was visible in varying degrees on all 12 individuals. Ante-mortem fractures were found in four individuals and recent sharp-force perimortem trauma on two. The results were compared to sixteen pit burials from the Maiden Castle and Danebury hillfort (Dorset) publications. The study revealed no uniformity in the orientation/ position of the burial, and no differential treatment of the burial based on sex or age. There is also a lack of uniformity in burial depth at both Winterborne and Gussage. However, there is a tendency for individuals with degenerative joint disease to be buried at partial pit depth, rather than at the bottom. This study theorises that burials in re-used storage pits are not the result of convenience, but rather special deposits placed with deliberation and purpose, with burial depth as a potential indicator of social status of the deceased.

10 CREATION OR MANIPULATION OF THE MEMORY? THE RE-USE OF THE TUMULUS IN LERNA IN EARLY MYCENAEAN PERIOD.

Author: MA Dudlik, Katarzyna - Adam Mickiewicz University (Presenting author)
Keywords: Lerna, early-Mycenaean, tumulus
Presentation Preference: Oral

Argolid was a flourishing center of the Peloponnese in Early Bronze Age, with a site of Lerna as one of the biggest during this time. A monumental building, known as "House of the Tiles", was most likely the center of the life of local community, with the administrative and representative functions. The building collapsed in a fire and the tumulus was built above the remains. Around 500 years later, two shaft graves were dag into it. They clearly outstood from typical mortuary behaviors in Argolid and it is possible that they belonged to the upper class of society. In the final stage of Late Bronze Age, they were purposely emptied from the offerings and bones.

Tumuli were one of the main interferences into the natural landscapes during Bronze Age in Greece, although they usually were constructed to cover the tombs, not buildings. Their purpose was to mark the graves and to commemorate the ancestors. Based on the other concept, they could be interpreted as a connection between present and past and between living and death worlds.

The re-use of tumulus in Lerna should be connected with a wider changes in pre- and early Mycenaean society. The proposed interpretation will be based on the creation and manipulation of the memory. First, local society created the memorial of the passed power and then, they decided to re-establish that place in relation to the burial sphere, again connected to the local elites and power. The concept, known from the usual mortuary practices, now was transformed by the local society to their own needs.

11 FROM LIFE TO DEATH. BURIAL PRACTICES AND RITES FROM THE MIDDLE BRONZE TO EARLY IRON AGE IN NORTH-WESTERN POLAND.

Author: Laciak, Dagmara - Adam Mickiewicz University in Poznań, PolandJózefowska, Anna - Institute of Archaeology and Ethnology PAS in Wrocław, Poland (Presenting author)
Keywords: funerary rites, Poland
Presentation Preference: Oral

The most characteristic site type of the Bronze and Early Iron Age in Poland are cemeteries with cremation graves. From the beginning of archaeological research of this period they were described as set of objects and artifacts, mostly with a lack of reflection about beliefs and funerary rites. In recent years, the wide variety of techniques and contextual analysis have created new perspectives in archaeology to revise opinions and to introduce the theoretical and methodological approaches in interpreting funerary materials. Interdisciplinary study of burial rites allows to better understand past societies and how communities were constructed, their structure, status, gender, materiality, perception of the world and beliefs.

The newly acquired sources obtained in course of excavations in south-western Poland provide the richer and more varied picture of the culture of Urnfield period and confirms existence of regional province of the Hallstatt culture. The discovery of the spectacular long-term cemetery in Domasław, distr. Wrocław with more than 2000 graves (among them 300 in the form of wooden chambers, richly equipped) was the starting point for modern study of society continuing extensive contacts with the others centres of Europe.

The new research and cooperation between archaeologists, anthropologists, biologists, chemists allow for interpretation and synchronization many of different aspects from mortuary sphere of the societies. Interesting answers give us the results of the analysis of grave goods, textiles, C14 dating, pottery studies, botanical research and GIS analysis. The new view and study on funeral objects completes the sociocultural image of Europe in the Bronze and the Early Iron Age.

12 RECENT RESEARCHES ON NUMANA NECROPOLIS (IXTH-IIND CENTURIES B.C.)

Author: Prof. BALDONI, VINCENZO - University of Bologna (Presenting author)
Keywords: Picenum necropoleis analysis
Presentation Preference: Oral

A recent research project began by an équipe from the University of Bologna concerns the largest necropolis in Numana, the most important center of the Picenum during the Iron Age (Marche and Abruzzo regions, on the mid-Adriatic Italian coast). The analysis aims to fill a gap: studying on ancient Numana is quite incomplete and only a few funerary contexts have been edited, until now.
The study focuses on more than 200 unedited burials, dated from the IXth to the IInd century B.C., excavated during the 1970s. Such burials, documented in detail, are now studied in a systematic way, as complex arrangements (tomb structure, funerary sets, rituals), which can offer much information on cultural changes and on the social structure of the ancient community in its diachronic development.
The present contribution gives the first results of the investigation carried out with a multidisciplinary methodology, recording and reading the large amount of available data (GIS, geomorphology, 3D reconstruction of burials, etc.).

13 THE LATE ANTIQUE AND EARLY ISLAMIC NECROPOLES OF MATMAR AND MOSTAGEDDA, MIDDLE EGYPT: CHRONOLOGY, COMMUNITY, AND LARGER SOCIAL CONTEXT

Author: Mr. Boudin, Mathieu - Institut Royal du Patrimoine Artistique, Brussels
Co-Author: (current PhD. Student) Plesa, Alexandra - Vrije Universiteit Amsterdam (Presenting author); Mr. Van Strydonck, Mark - Institut Royal du Patrimoine Artistique, Brussels
Keywords: Egypt, Christianity, Islam
Presentation Preference: Oral

After having worked with Sir William M. Flinders Petrie in the Badari region for most of the 1920s, Egyptologists Guy Brunton (d. 1948) and wife Winifred (d. 1959) decided to continue self-funded excavations in a neighboring, previously unexplored area, close to the villages of Matmar and Mostagedda (27°06'26.2"N 31°19'43.1"E - 27°03'21.8"N 31°25'05.0"E). Between 1927 and 1931, Brunton conducted three field seasons at each site, uncovering settlements, necropoles, and cultic structures dating to almost all times of Egyptian history. Among these, several cemeteries, whose corresponding settlements were never found, were assumed to date from "Ptolemaic or early Roman" to the "early Arab" times. The resulting monographs only briefly describe a selection of individual tombs, and lack information about the chronology of these cemeteries, their makeup, or that of the communities using them.

This presentation aims to reassess the chronology of the cemeteries at Matmar and Mostagedda, and to discuss the characteristics of the communities making use of them, by setting the evidence on site in the larger social and religious context of Late Antique and early Islamic Egypt. The technical and stylistic analysis of several hundred grave goods surviving in museums across Europe is corroborated with the evidence provided by the radiocarbon dating of 20 textile samples, undertaken at the laboratory of the Institut Royale du Patrimoine Artistique in Brussels. Jointly, these indicate that all areas assumed to have contained tombs dating from "Ptolemaic or early Roman" to "early Arab" times appear to have been used between the 4th and the late 8th century CE. The communities burying their dead on site were most likely rural and dependent on agricultural work. Although probably nominally Christian, their burial practices display features associated with both Christianity and earlier, traditional cults.

14 WATER OF THE DEAD: MORTUARY LANDSCAPES AND ANCIENT HYDRAULICS IN THE ANDES

Author: Prof. Herrera, Alexander - Universidad de los Andes (Presenting author)
Keywords: mortuary, landscapes, hydraulics
Presentation Preference: Oral

The complex interplay of mortuary and hydraulic landscapes in mountains is addressed in this paper from a perspective informed by ethnographic, historic, archaeological and bioanthropological accounts on the past and present meaning, disposition and contents of collective chullpa tombs in the Huaylas Valley of Peru. These mortuary monuments, awilupawain or the houses of the ancestors, mark Andean agro-pastoral history (200-BC-present) through their fundamental association with the development of hydraulic technology at critical junctures of the glacial landscape. Necropolis in basin headwaters in particular bear witness to the development of relic terrace systems, canal networks and bofeladal wetlands, that saw marked increases in water catchment for irrigation, and deep histories of mortuary and ceremonial ritual. Tomb clusters built below, along or around specific water catchment and production features suggest claims over water were ancestralised through mortuary ritual, and that mortuary communities sought to play prominent roles in these negotiations. The systematic destruction, looting and bulk removal of human bone remains from chullpa tombs that accompanied forced resettlement during the colonial period sought to sever the links between the living and those dead to delegitimise veneration practices intimately tied to the social organisation of water control.

15 CONCEPTUALISING DEATH THROUGH THE CANDOSHI

Author: Ph.D Student Kolp-Godoy, Maria - University of Zurich; CIABG
Co-Author: M.A. Silvia Mónica, Panaifo Teixeira - Centro Mallqui (Presenting author); B.A. Ana, Fernández Valdivia - UNMSM; CIABG (Presenting author); M.A. Violeta, Chamorro - Universidad Nacional de Trujillo (Presenting author)
Keywords: Candoshi, funerary practices
Presentation Preference: Poster

Death involves a gradual process of physiological, social and ritual transformation of the dead and its descendants. The transition from life to death is not clear-cut, the perception of the body as a corpse varies as the funeral develops, making it difficult to define death in archaeology. To infer through the material evidence how descendants handle bodies and perceived death is crucial. Ethnographical studies provide guidelines for understanding this transformation process.

This poster aims to conceptualize death through the analysis of the funerary practices observed in the Candoshi community, which is located in the province of Alto Amazonas, Peru. Their limited contact with mestizos has allowed them to preserve their ancient funerary practices to this day.
Once the individual dies, the body is placed into a single wooden structure called Kavonima, which is oriented to the west to ensure the deceased will find its way back. The Candoshi believe that the dead would come and go from the Kavonima at will. Years later, as part of a secondary burial, the body is removed and buried in a fossa adjacent to the home. Houses are not only the repository of bodies, but meaningful spaces that embrace communal memories. The inner nature of the deceased embodies a larger spiritual significance. Depending on the individual's behaviour in life, he will be recognized in the form of natural phenomena, such as lightning. This secondary practice affords a temporal and spatial separation between the initial rite of liminality, and these concluding rites of incorporation, promoting new levels of social kinship.
In order to improve our understanding of death in past populations, especially when working in archaeological sites in the Amazon, we have to take into consideration ethnographic cases like Candoshi, which sheds light on the relationship between death, body transformation, landscape, and social ties.

136 BRIDGING THEORETICAL AND PRACTICAL DIVIDES IN PUBLIC ARCHAEOLOGY

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Oldham, Mark (Norway) - Norwegian Institute for Cultural Heritage Research
Co-Author(s): Matsuda, Akira (Japan) - University of Tokyo
Keywords: Public archaeology, theory, practice, engagement
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Arguably ever since Merriman's 'Public Archaeology', the concept of public archaeology has been divided and subdivided into various types and categories, often reflecting more theoretical or more practical oriented approaches. Such an expansion of subdivisions has broadened our understanding of the field, but to what end? Have we ended up in a practical and ideological straightjacket? And what is the relationship between how we categorise and think about public archaeology and how we implement it?

Hence, taking inspiration from the motto of this conference, this discussion session aims to 'build bridges' between the theoretical and the practical, between the educational and the critical, between pluralism and public relations, and the rest of the subdivisions that have been created. Is an integrated approach possible or even desirable; should public archaeology projects aim to bridge the gap? How do we harmonise public archaeology as both a state of mind and a programme of work?

This session will comprise of both presented papers and an open discussion.

01 PUBLIC ARCHAEOLOGY PERSPECTIVES: FROM THEORY TO PRACTICE AND BACK AGAIN

Author: OLDHAM, MARK - Norwegian Institute for Cultural Heritage Research (Presenting author)
Keywords: Public archaeology, education
Presentation Preference: Oral

This article aims to take a more critical and investigative look at public archaeology, with NIKU's recent project "Skatter i mørkt jord" acting as an illustrative case study. Here, I will look at the concept of public archaeology and how it has been theorized, before examining how and where our project fits in, and finally think about how our practice can be improved by a more conscious and reflexive use of theory in educational settings.

02 TOO BIG TO FAIL: WHY PUBLIC ARCHAEOLOGY HAS BECOME MORE CRUCIAL TO PEOPLE'S LIVES THAN EVER BEFORE

Author: Dr Grima, Reuben - University of Malta (Presenting author)
Keywords: Faro, Public, Archaeology
Presentation Preference: Oral

During the late 1990s, and into the first decade of the new millennium, a series of publications, declarations and international instruments articulated the citizen's rights to enjoy environment, landscape, and cultural heritage more clearly than ever before, culminating in the 2005 Faro Convention. Issues which Public Archaeology had long been grappling with were now catapulted into the mainstream of public debate, creating new responsibilities and new challenges for its practitioners. Some of the optimism that surrounded such statements when they were made has since been tempered by the realisation that public enjoyment of the archaeological resource will continue to be threatened by competing interests. The incremental impoverishment of the public by eroding its enjoyment of the historic environment, in the interest of the financial gain of the few, remains a perennial risk in many countries. It will be argued that, against this fast-moving backdrop, the broad realm of Public Archaeology has a pressing and vital role to play, and ill affords to spend too much more time debating its own precise definition. Its task is simply too big to afford to fail.

03 PREMISES OR PROMISES? THE DIFFICULT RELATIONSHIP BETWEEN THEORETICAL AND PRACTICAL APPROACHES IN ITALIAN PUBLIC ARCHAEOLOGY

Author: Ripanti, Francesco - University of Pisa (Presenting author)
Keywords: Italy, public archaeology
Presentation Preference: Oral

Models and categories facilitate our understanding process, vehiculating our assimilation of concrete and complex "things". However, when a reference system is set, it becomes difficult to think out of the box: the risk to end up in a blind alley becomes perceivable. Then, how to deal with these abstractions looking forward to the development of practical applications? And, what if we need to invert the approach?

Italian public archaeology is living a period of innocence: the growing commitment toward a more mature dialogue between archaeology and the public is matching a proliferation of audience engagement activities. But these are thriving practices that lack both a basic critical reflection and shared methodologies.

In recent times, the rising efforts toward a rationalisation of public archaeology "phenomena" resulted in a well-built global debate around the theoretical models. The emerging dichotomy between practice-oriented and theory-oriented models has been recognised by several scholars, and actually comprehends even the Italian state of the art. The prevalent practice-oriented character of the Italian public archaeology projects puts in first place the need to deal with sustainability in all its forms, starting from the financial one. However, this process must necessarily go through the development of dedicated methodologies.

This paper wants to draw some insights out from the peculiar development of public archaeology in Italy and discuss them in an international perspective. It aims to produce a core group of answers functional to narrow the gap between theory and practice and to come closer to a methodologic draft. Some central questions are: should the adoption of a critical approach be the premise for every archaeological research project? How and why the promise of a more ethical practice should influence our workflow?

04 210 BC - THE CONQUEST OF AKRAGAS - A CASE OF POPULARIZATION IN SICILY

Author: Speciale, Claudia - PastActivityVirruso, Giovanni - PastActivity
Co-Author: Danile, Laura - PastActivity (Presenting author)
Keywords: Sicily, Archaeology, Reenactement
Presentation Preference: Oral

The cultural association PastActivity was born in 2016 from the idea of two archaeologists, Laura and Giovanni, along with the external cooperation of a third one, Claudia. They have been working in museums and popularization in archaeology for several years. PastActivity's main goal is the valorisation of the landscape and the cultural heritage through a better knowledge and understanding of the past and of its traditions. Activities are suited for a wide range of people: researchers, enthusiasts, families, schools, both young and old people, travellers and any other history lover. Their approach combines scientific bases with new communicative languages giving everyone the chance to dive into a lost world.
Our first project aimed to organize an event of didactic archaeology and historical re-enactment in the Archaeological Park of the Valley of the Temples of Agrigento (Sicily, Italy): 210 BC – The Conquest of Akragas. We are in the middle of the attacks of Hannibal, Punic and Roman armies are fighting for Sicily and struggling for the control on Akragas. Walking among the tents of the soldiers' camps, visitors plunged into daily life of the end of III century BC. They met women spinning their tissues or a doctor treating a wound, admired the amazing glass necklaces made by Carthaginians, discovered Punic and Roman recipes, watched some of the scenes of military training to feel like they are the leading characters of this colourful and resounding experience.
The project was developed thanks to a team of selected students from the MA of Archaeology and Cultural Heritage of University of Palermo and the High School Liceo Classico Empedocle of Agrigento; they followed all the management of the venue and were the guides through the camps during the venue.

05 'ARCHEOSTORIE JOURNAL OF PUBLIC ARCHAEOLOGY': AN ITALIAN BRIDGE BETWEEN THEORY AND PRACTICE

Author: Dal Maso, Cinzia - Center for Public Archaeology Studies Archeostorie; editor in chief, Archeostorie. Journal of Public Archaeology (Presenting author)
Co-Author: Peyronel, Luca - Department of Humanities, University IULM of Milan; editor in chief, Archeostorie. Journal of Public Archaeology
Keywords: Archeostorie, public archaeology
Presentation Preference: Oral

A lot of practice with little theory. This is the current scenario of Public Archaeology projects in Italy, both in fieldwork and museums. New and innovative public outreach activities are thriving, but the trend has not yet become part of an accurate and scientifically established practice. Most of the projects lack theoretical background, accurate strategy and planning of activities (negotiated with all stakeholders) and, above all, precise ex-post evaluation. Through the publication of Archeostorie. Journal of Public Archaeology, an open access peer-reviewed scientific journal (www.archeostoriejpa.eu), we intend to stimulate Italian archaeologists to measure the impact of their outreach activities, analyzing them according to sound theory and methodology. Only when a fair number of qualitative and quantitative analyses of Italian public archaeology projects will be available and comparable, it will be possible to identify some national trends, and outline the specific impact of archaeology on Italian society.

Even if the Journal focuses mainly on Italy, it also deals with the main Public Archaeology themes debated worldwide. It privileges concrete analyses, tangibly rooted in specific contexts, because every age, as well as every nation and every community, looks at its past in a peculiar way. The community's relationship with its past is a mirror of the community itself in that specific time. Therefore, whatever issue archaeologists deal with, even the most generic one, they cannot do without an accurate analysis and experience of the role of the past within the community. Again, theory and practice together: this is what Public Archaeology is all about, in our view. The papers included in the first issue of the Journal, published in Spring 2017, are a first attempt to bridge the gap between them.

06 LET 100 FLOWERS BLOSSOM -BUT PLEASE DON'T MAKE IT COMPLICATED

Author: Mr. SCHADLA-HALL, RICHARD TIMOTHY - Institute of Archaeogy UCL (Presenting author)
Co-Author: Mr Schadla-Hall, Tim - Insituute of Archaeology UCL
Keywords: consumption, clarity relevance
Presentation Preference: Oral

The growth of archaeology as a subject area of interest and research, and appeal in the last 100 years has been unprecedented, and without debating the intricacies of the subject in terms of historical development. This growth in interest and research has resulted in a relative explosion of the subject in academia accompanied by increasing fissiparity of research areas and subject areas, many of which have resulted in increasing speciality and even obfuscation. At the same time, the public (non-academic) interest in the subject has also grown exponentially and in all walks of life. The consumption, use, abuse and appropriation of the archaeological "product" in political, social, and economic spheres has developed often without direct input from archaeologists at a bewildering rate. This paper aims to examine how what might appear as an increasing gap between the academy and the rest of the world can be made more interrelated to the mutual benefit of archaeologists and that wider audience at last partially by promoting a common language and open approach.

07 TRIGGERING MEMORY AND MEANING FOR THE ONLINE PUBLIC; THE ABANDONED NATIONAL SCHOOLS OF IRELAND

Author: Mr. O' Flaherty, Enda - Rubicon Heritage (Presenting author)
Keywords: Memory Public-Engagement
Presentation Preference: Oral

This paper will explore the use of imagery, narrative and new technology and media as a method of triggering memory and meaning for the online public, and consequently encouraging engagement with, and contribution to, historical and cultural research.
For the past two years, I have been casually engaged in a personal research project documenting disused school houses in Ireland. This project began as a personal photo diary of a select number of aesthetically pleasing buildings, but has since expanded to include primary documentary research and constant engagement with the online public through a dedicated Blog, and through social media.

Public engagement has come from both home and abroad. For many who emigrated from Ireland at an early age, their days spent in these rural and isolated school houses often represented the last formal education they received before seeking a brighter future abroad. Although many of these buildings are now physically empty or approaching a point of collapse, the physical structures are cognitive stimuli for those who attended, and hold a wealth of memory and associations that shaped their understanding of the world around them at an early age.

The use of evocative imagery online has proven a stimulus for the public to engage with historical research on a personal level, teasing out the narrative of many of the abandoned school houses that I have visited and documented. Social media in particular has allowed the general public to easily share their experiences and memories, adding overlooked narratives to these buildings, and highlighting their significance as monuments to a changing rural Ireland in particular.

08 PUBLIC ARCHAEOLOGY, ECONOMY, AND THE ROLE OF EXPERTISE IN 2017

Author: Dr Matsuda, Akira - University of Tokyo (Presenting author)
Keywords: public archaeology
Presentation Preference: Oral

In this paper I wish to consider where public archaeology stands today in relation to two forceful global currents: economic neo-liberalism and populism. On the one hand, archaeological resources are supposed to generate more income than ever, adapting to the principle of market economy. Economic use of archaeological heritage is not new, but what is novel is the expectation - rather than a hope - that archaeology and its material by-products can contribute to economy substantially. Yet, we are tempted to ask, whose economy? Is that economy public (enough)? On the other hand, there is a surge of populism across the world, when, coincidentally, the heritage discourse increasingly emphasises the notion that everyone is a heritage expert (e.g. Schofield 2014). What, then, is the role of archaeologists in public archaeology? Are they still 'distinctive' experts? How is public archaeology different from populist archaeology? One should remember that these questions are never purely theoretical, since once in the field each public archaeologist has to come up with his/her own practical responses to them.

140 MULTI-TECHNIQUE APPROACHES TO INVESTIGATING MOBILITY WITHIN HIGH-RESOLUTION CHRONOLOGICAL FRAMEWORKS

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Díaz-Zorita Bonilla, Marta (Germany) - Tübingen Universität
Co-Author(s): Hamilton, Derek (United Kingdom) - Scottish Universities Environmental Research Centre
Keywords: radiocarbon, strontium, oxygen, sulfur, hydrogen
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Among of the strategic themes for the EAA Maastrich 2017 are the recent developments in the fields of Big Data, new quantitative modelling methods, and results from DNA and strontium isotope analyses and related scientific methods. During the past few years, the scientific community has observed an increase of the application of these new methods, which has resulted in re-interpretations of past societies. Specifically, high-resolution chronological methods have been combined with isotopic analyses to investigate past human mobility, seasonality and migration. The purpose of this session is to discuss the new possibilities of combining methods, the application of mixing models, and of course to present case studies where radiometric dates have been combined with analyses of mobility tracers (e.g. aDNA, strontium, oxygen, hydrogen, and sulfur) in order to investigate mobility of both people and animals.
This session is aimed at those scholars working with AMS radiocarbon dates, radiogenic (87Sr /86Sr) and stable (δ18O, δD, δ34S) isotope analysis, and aDNA to present their research but also to discuss the highlights and limitations of the methods.

01 MATCHING HUMAN LIFETIMES TO HUMAN LIFEWAYS: REFINING UNDERSTANDING EARLY NEOLITHIC MOBILITY IN ALSACE

Author: Dr. Bickle, Penny - University of York (Presenting author)
Keywords: Strontium, Linearbandkeramik, lifeways
Presentation Preference: Oral

The combination of Bayesian chronological modelling of radiocarbon dates and the detailed information provided by stable isotopic analysis, provide archaeology with opportunity to match human lifetimes with human lifeways. Hence, a more refined understanding of change over time and social diversity within a prehistoric population is possible. This paper will bring together a new Bayesian chronology with isotopic data from human burials to assess change over the early Neolithic in the Upper Rhineland, particularly exploring how mobility patterns may have developed and varied between different individuals towards the end of this period. The early Neolithic in this region is known as the Linearbandkeramik (LBK, c.5500-5000 cal BC), and the factors which led to its demise are currently debated. A contribution to this discussion will be made here, by examining what strontium isotope analysis in combination with a new chronology can tell us about how human lifeways and mobility patterns changed in Alsace between 5300 and 5000 cal BC. The data on which the paper is based draws on the results of two projects. First, the Bayesian chronology for lower Alsace, produced by The times of their lives project, led by Alasdair Whittle and Alex Bayliss (Denaire et al. 2017). Second, the stable and strontium isotope data produced by The LBK lifeways project (Bickle & Whittle 2013).

Bickle, P. & Whittle, A. (eds). 2013. The first farmers of Central Europe: diversity in LBK lifeways. Oxford: Oxbow.
Denaire, A., Lefranc, P., Wahl, J., Bronk Ramsey, C., Dunbar, E., Goslar, T., Bayliss, A., Beavan, N., Bickle, P. & Whittle, A. 2017. The cultural project: formal chronological modelling of the early and middle Neolithic sequence in Lower Alsace. Journal of Archaeological Method and Theory DOI 10.1007/s10816-016-9307-x.

02 GENETIC REFLUX IN MIDDLE NEOLITHIC PORTUGUESE ESTREMADURA? ANCIENT DNA EVIDENCE FROM BARRÃO AND BOM SANTO BURIAL-CAVES

Author: Professor Carvalho, António - University of Algarve
Co-Author: Dr Fernández, Eva - Durham University (Presenting author); Ms Robinson, Catherine - Liverpool John Moores University
Keywords: aDNA, Middle Neolithic,
Presentation Preference: Oral

Ongoing isotope and palaeogenetic analyses at the Barrão and Bom Santo burial caves (≈3800–3100 BC), located in the Estremadura region of central-coastal Portugal, allowed the first in-depth studies on the Middle Neolithic populations—i.e., the earliest megalith builders—in the country to be carried out. Available results indicate a strong reliance on terrestrial resources (along with variable percentages of freshwater inputs in diet if favourable ecological conditions are met) and relatively high mobility indexes. Mitochondrial DNA analyses revealed high frequencies of haplogroup U sub-types (sub-haplogroup U5 in particular), which are being recognized as characteristic of the last Mesolithic foragers and seem to be absent or only marginally represented among the earliest farmers. This re-emergence of haplogroup U has been equated in other European regions with population reflux from areas where forager communities kept their lifeways throughout the fourth millennium. However, this is not the case in Western Iberia, where the last forager groups extinguished in the sixth–fifth millennia transition. Here, this reflux phenomenon seem to be sought in the absorption of Mesolithic groups by early farmers.

03 DIETARY AND MOBILITY PATTERNS IN NORTHERN IBERIA. MULTI-ISOTOPE ANALYSIS OF CHALCOLITHIC IRUAXPE I AND URTAO II (ARETXABALETA, GIPUZKOA) ARCHAEOLOGICAL SITES.

Author: Sarasketa-Gartzia, Izaskun - University of Basque Country (Presenting author)
Co-Author: Villalba-Mouco, Vanessa - University of Zaragoza; Arrizabalaga, Álvaro - University of Basque Country; Salazar-García, Domingo Carlos - University of Basque Country; University of Cape Town; Max Planck Institute for the Science of Human History; Ikerbasque Basque Foundation for Science
Keywords: diet, mobility, isotopes
Presentation Preference: Oral

Carbon and nitrogen stable isotope ratio analysis on bone collagen is a common technique used to recover direct information on diet from prehistoric times. Combined with strontium isotope ratios on teeth enamel, used to track provenance, they are a powerful tool to get new information on past social dynamics. We here present results of human and faunal remains from the Chalcolithic sites of Iruaxpe I and Urtao II (Aretxabaleta, Gipuzkoa), some of the first from these chronologies in northern Iberia. Results show an homogeneous diet based on C3 terrestrial resources amongst both populations. However, at both sites there are some individuals showing a non-local strontium signature. At the time when increased social hierarchy starts to appear in the archaeological record, it is interesting to see how peoples from different origins have same dietary patterns.

04 REASSESSING COPPER AND BRONZE AGE REGIONAL MOBILITY PATTERNS IN CENTRAL IBERIA THROUGH RADIOGENIC (87SR/86SR) AND STABLE (Δ18O, Δ13C) ISOTOPE RATIOS

Author: Dr. Díaz-Zorita Bonilla, Marta - Tübingen Universität (Presenting author)
Co-Author: Dr. Waterman, Anna - Mount Mercy University; Dr. Pérez Villa, Alberto - UNED; Dr. Martínez Navarrete, María Isabel - CSIC, Instituto de Historia; Dr. Vicent, Juan - CSIC, Instituto de Historia; Prof. Bocherens, Hervé - Tübingen Universität; Dr. Díaz del Río, Pedro - CSIC, Instituto de Historia
Keywords: mobility, Prehistory, isotopes
Presentation Preference: Oral

Recently published radiogenic (87Sr/86Sr) and stable (δ18O, δ13C) isotope ratios analyses performed on 82 human Copper and Bronze Age individuals interred in Central Iberia suggest mobility was lower than previously proposed. The scarce (5%) non-local individuals identified have ratios that point to regions with substantially older lithology. However, still little is known about the actual movement of individuals across this landscape. Throughout the year 2016, and in order to contrast our conclusions, we have expanded the sampling in Central Iberia to include bordering regions. This investigation is using a combination of methods to research mobility such as stable isotope of oxygen (δ18O) and strontium isotope ratios (87Sr/86Sr) in combination with radiocarbon dates (AMS). Based on the approximately 6000 square km now sampled, our preliminary results seem to confirm previous conclusions on the mobility of prehistoric communities, while offering new data to reassess regional variability of isotopic ratios.

05 CONTRASTING SIGNS OF MIGRATION IN MEGALITHIC GRAVES OF WESTERN SWEDEN

Author: Blank, Malou - Göteborgs Universitet
Co-Author: Dr M Svensson, Emma - Uppsala Universitet (Presenting author); Dr Sjögren, Karl-Göran - Göteborgs universitet; Dr Storå, Jan - Stockholms Universitet; Prof Jakobsson, Mattias - Uppsala University
Keywords: aDNA, Sr-isotopes, mobility
Presentation Preference: Oral

During the Neolithic period in Scandinavia the Funnel Beaker complex gave way to the Battle Axe complex, which later was replaced by the more homogeneous Late Neolithic complex. Here we contrast genetic and isotopic data from individuals belonging to the Middle (3350- 2350 BC) and the Late (2350- 1700 BC) Neolithic in Sweden. In Scandinavia the Funnel Beaker complex is associated with the megalithic building and the introduction of agriculture. In the Late Neolithic period, a population increase as well as an increase in average height is observed in southern Scandinavia, when the later megalithic gallery graves expanded into new areas. This has often been explained by an intensification of agriculture and an ameliorated general health and in some cases by immigration from various regions. Falbygden in western Sweden presents one of Northern Europe's largest concentrations of Middle Neolithic passage graves and a large amount of Late Neolithic gallery graves. This dense collection of graves thus allows for following populations buried in the area over a long period of time.
The geology of Falbygden differs from that of surrounding areas, implying good prospects for identifying mobility using Sr isotopes from the buried individuals. aDNA analyses can be used for sex identification that coupled to both diet and Sr isotopic results can be used to discuss mobility patterns.
We use results from three gallery graves in Falbygden as a model to investigate how mobility can be manifested in the archaeological record. These results are then put in a wider Neolithic context as well as a larger geographical framework. The purpose of this paper is to address questions of migration and mobility at different time points as well as on different time scales during the Scandinavian Neolithic, using the combined knowledge gained from archaeology, isotope and ancient genomic analysis.

06 PATTERNS OF MOBILITY AND TRADE IN LATE PREHISTORIC PORTUGAL: USING STRONTIUM ISOTOPE (87SR/86SR) SIGNATURES TO IDENTIFY MIGRATION AND NATAL LANDSCAPES

Author: Dr. Waterman, Anna - Mount Mercy University (Presenting author)
Co-Author: Dr. Wright, Elizabeth - University of Sheffield; Dr. Kunst, Michael - German Archaeological Institute, Madrid; Dr. Cardoso, João Luís - Aberta University; Dr. Figueiredo, Alexandra - Instituto Politécnico de Tomar; Dr. Peate, David - University of Iowa
Keywords: Chalcolithic, Portugal, strontium
Presentation Preference: Poster

Archaeological evidence from late prehistoric societies in Portugal suggests some form of chiefly cycling, in which large population centers formed, flourished, and then suddenly declined. It is assumed that population migration and trade played important roles in this cycling, but our understanding of these movements are still limited. Analyses of 87Sr/86Sr ratios in dental enamel can be used to identify prehistoric humans and animals who were buried in geologically distinct locales than the ones inhabited during dental development –thus allowing for patterns of mobility and trade across prehistoric landscapes to be established. This study uses 87Sr/86Sr data to discern the movement of Chalcolithic people and animals in the Estremadura region of Portugal near the Late Prehistoric settlement site of Zambujal (Torres Vedras). While evidence of human mobility appears to be limited, by linking identified migrants with 87Sr/86Sr data from the surrounding landscapes we proposed patterns of movement from the Zambujal region, the Portuguese interior, and the Lisbon coast.

07 CELTIC COWBOYS: REVISITED

Author: Dr. Hamilton, Derek - University of Glasgow (Presenting author)
Co-Author: Dr. Sayle, Kerry - University of Glasgow; Prof. Haselgrove, Colin - University of Leicester; Prof. Cook, Gordon - University of Glasgow
Keywords: isotopes, radiocarbon, δ34S
Presentation Preference: Oral

The middle of the Iron Age in southern central Britain (c. 400–200 cal BC) is a period that is often seen as becoming regionally inward-looking. A primary focus of the mixed agriculturalists is on building and maintaining massive hillforts. There is very little long-distance exchange or trade noted in the archaeological record, and the metalwork at the time takes on insular forms (e.g. involuted brooches) that separate it from the Continental connections observable in both the Early and Late Iron Age.

This paper will present the results of recent multi-isotopic work (δ13C, δ15N, and δ34S) on animal bone collagen from the Wessex sites of Suddern Farm and Danebury hillfort, which alter this narrative. We suggest that the high variability in δ34S observed within the horses is directly related to these animals being used to cover large distances, while these same numbers in cattle are indicative of them being moved potentially upwards of 100–300 km prior to their death and deposition. The scale of the mobility within the animal populations leads us to question the broader economy at this time.

08 TO MOVE OR NOT TO MOVE. SHEEP HERDING STRATEGIES IN IRON-AGE NORTH-EASTERN SPAIN INFERRED FROM STRONTIUM AND OXYGEN ISOTOPIC ANALYSES

Author: Dr Valenzuela-Lamas, Silvia - Consejo Superior de Investigaciones Científicas (Presenting author)
Co-Author: Dr Orengo, Hector - University of Cambridge; Prof. Bosch, Delphine - Université de Montpellier; Dr. Salazar-García, Domingo-Carlos - University of Cape Town; Prof. Halstead, Paul - University of Sheffield; Mr Jiménez-Manchón, Sergio - Université de Montpellier; Mr López-Reyes, Dani - Arqueovitis; Mr Jornet-Niella, Rafel - Universitat de Barcelona
Keywords: Mobility, zooarchaeology, isotopes
Presentation Preference: Oral

The site of El Turó de la Font de la Canya was specialised in cereal storage and the archaeological material recovered from storage pits provides a high-resolution chronology of occupation from the 7th c. BC to the 2nd c. BC.
In this paper we present 81 strontium and 135 oxygen isotopic ratios from 27 sheep teeth, 9 from each chronological phase of occupation: the first Iron Age (7th c. BC), the so called 'Ancient Iberian' (6th – 5th c. BC) and the 'Middle Iberian' (4th – 3rd c. BC). The results suggest that sheep grazed in the surroundings of the site all the year round and, therefore, no

seasonal movements to the nearby Garraf massif were recorded. In the last phase of occupation (4th – 3rd c. BC), a higher degree of movement is attested, coinciding in time with the consolidation of state structures in the Iberian culture.
The isotopic results will be contextualised with the zooarchaeological data from this area, as they suggest that the lack of mobility shaped animal husbandry in this particular period of time.

i42 PEOPLE OF THE NORTH SEA

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Nieuwhof, Annet (Netherlands) - Groningen Institute of Archaeology
Co-Author(s): Deckers, Pieterjan (Belgium) - Vrije Universiteit BrusselNicolay, Johan (Netherlands) - University of GroningenSiegmüller, Annette (Germany) - Lower Saxony Institute for Historical Coastal Research
Keywords: North Sea, Anglo-Saxons, migration, identity
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

MERC
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The Migration period (4th-5th centuries AD) and its aftermath was a formative phase in the history of the lands bordering the North Sea. Migrations resulted in the formation of new societies, which not only developed new identities, but also a shared maritime culture that tied the North Sea communities together and placed them within a wider trading and exchange network that included Scandinavia and Continental Europe. Our knowledge of these developments is fragmented, since it is part of different fields (archaeology, language, toponomy, genetics, early literature studies) and it is often hidden in national and regional studies.
Our aim is to come to a better understanding of the events and processes that took place in this period: Is the evidence indicative of migration of people or rather of ideas? Was migration 'pushed' by unfavourable circumstances or 'pulled' by attractions in the regions of destination? How large were the groups of migrants? Can we discern different phases and origins? How did new identities, polities and cultural expressions emerge from this patchwork of migrant and autochthonous groups?
In this session we seek papers that approach the early medieval history of the North Sea area from different angles and regions. They may focus on traces of migration and inter-regional contacts, such as imports or changing styles and customs, evidence of continuity and discontinuity, or water routes and landing places. Papers that combine archaeological and historical sources are very welcome.

This session complements Beyond migration: interdisciplinary approaches to mobility in early medieval Europe

01 MIGRATION AND THE IMPORTANCE OF NETWORKS DURING THE 3RD-5TH CENTURIES: THE EVIDENCE FROM THE TERP REGION OF THE NORTHERN-NETHERLANDS

Author: Dr. Nieuwhof, Annet - University of Groningen (Presenting author)
Keywords: Migration, networks, pottery
Presentation Preference: Oral

The terp region of the northern-Netherlands is the scene of great changes between the 3rd and 5th century AD. During the 3rd century, the inhabitants started to leave the area, probably as a result of combined natural and social processes. During the 4th century, the area was nearly abandoned, with the exception of some terp settlements in the eastern part of the region. The patterns of abandonment and continuity appear to be related to socio-cultural networks. Pottery research has revealed that there were close connections between the northern Netherlands and northwestern Germany already during the late pre-Roman Iron Age. These connections became even closer during the Roman Period, in particular between the eastern part of the terp region, the adjacent pleistocene region and neighbouring Germany. When emigration started in the 3rd century, the western part of the terp region, the present province of Friesland, lost its social coherence, while the eastern part remained part of the socio-cultural network that extended far into Germany.
New inhabitants repopulated the abandoned area from around AD 400. They are traditionally called Anglo-Saxons, because of the striking resemblances between the material culture of the newcomers and the material culture of the presumed homelands of the Angles and Saxons. However, in settlements that were not abandoned during the 4th century in the northern Netherlands, pottery style and burial ritual developed in the same way as in the east. The coastal and adjacent inland areas of the northern Netherlands and northwestern Germany seem to have shared the same cultural tradition, so were the immigrants really Anglo-Saxons?
This paper will present the evidence for migration in the terp region, and for the existence of socio-cultural networks that played such an important role. It will also set out some lines of investigation for future research.

02 THE LATE ROMAN LIMES REVISITED. THE CHANGING FUNCTION OF THE ROMAN ARMY IN THE DUTCH RIVER/COASTAL AREA (AD 260-406/7).

Author: van der Meulen, Berber - Vrije Universiteit Amsterdam (Presenting author)
Keywords: Limes Landscape Defense-in-depth
Presentation Preference: Oral

The aim of my paper is to add a new, archaeologically based perspective on the function and socio-economic role of the late Roman limes and challenge the common notion that it was meant purely for defensive strategy. Connected to this focus on defense is the idea that the Late Roman borders were straining under the stress of "barbarian" incursions and migration. Both assumptions will be challenged in my paper.
This will be done by mapping the archaeological evidence for Roman military investments and activities between AD 260 and 406/7 in the Dutch river area (Rhine and Meuse) and coastal area (Litus Saxonicum). A number of dynamic maps will be presented, showing how the "limes zone" (taken here in its broadest sense) developed during this period. These developments will be taken as a proxy value for the changing socio-economic landscape of the Late Roman empire, in order to investigate paradigms on migration and violence.

03 A CONSCIOUS EMULATION OR A PRACTICAL APPROACH? THE RE-OCCUPATION OF ROMAN VILLAS IN SAXON ENGLAND AND THE MEROVINGIAN LOW COUNTRIES

Author: Mhr. Dodd, James - VU Amsterdam (Presenting author)
Keywords: Villae, Reoccupation, Reuse
Presentation Preference: Oral

The movement of peoples in the 4th and 5th century into the former Roman provinces of the North Sea littoral brought about great changes to the rural socio-economic fabric. The classical villa system, which dominated Eastern England and parts of the Low Countries was in flux, abandonment and transformation at sites was commonplace. This paper intends to examine the processes and reasoning behind the occupation of villa centres in various stages of abandonment by new immigrants. Presenting new synthesised data from Kent, and building on the work done by Heeren (2017), this paper intends to establish that groups of newcomers were consciously reusing and reoccupying Roman rural sites on both sides of the North Sea. It will evaluate the purposes behind this phenomenon, addressing both habitational occupation at these sites, as well as the apparent strategic placing of cemeteries in Roman buildings, questioning whether this is an emulation of the Roman past, or whether it was a solely practical approach of reutilising those sites best placed for the exploitation of the landscape.

04 LANDSCAPES OF OTHERNESS? MIGRATION, 'ETHNICITY,' 'APARTHEID-LIKE STRUCTURES' AND CULTURAL DIFFERENCE IN THE EARLY MEDIEVAL ENGLISH LANDSCAPE C400-800AD

Author: Dr Oosthuizen, Susan - University of Cambridge (Presenting author)
Keywords: migration, early medieval
Presentation Preference: Oral

Fifth- and sixth-century migration into Britain from north-west Europe is widely regarded as the most significant driver in explaining transformative changes in material culture in post-Roman Britain, and the emergence of Old English as one of the latter's principal languages. A leading strand of historical and archaeological scholarship has as a result focused on the structure of the relationships between incomers and indigenous communities in explaining the origins of 'Anglo-Saxon' England.
The paper begins with a re-examination of models of the migration process, the premises and arguments for ethnicity as the defining criterion that framed relationships between indigenous communities and incoming groups, and for the proposition of the formal or semi-formal separation between them that is sometimes characterized as 'apartheid-like'. It uses archaeological, documentary, and typonymic evidence to evaluate those models through an an exploration of the impact of migration on the evolution of early medieval political structures, land-use and communities in the landscape of the East Anglian fenland, believed to have been one of the earliest regions to be settled by those post-Roman colonists.

05 LIVING, DYING, AND THE CREATION OF THE EARLY MEDIEVAL KINGDOM OF NORTHUMBERLAND, C. 300-800 CE

Author: Dr Buchanan, Brian - Durham University (Presenting author)
Co-Author: Dr Semple, Sarah - Durham University; Dr Harrington, Susan - Durham University
Keywords: funerary, landscape, Northumbria
Presentation Preference: Oral

The 4th and 5th centuries witnessed dramatic alterations to the social and political fabric of Britain due to withdrawal of Roman authority, climatic change, and the arrival of migrants both from the continent and from within different regions of Britain. Northumbria was one of the largest kingdoms of early medieval Britain that emerged from this period and at its greatest extent stretched from the Firth of Forth to the Humber Estuary and from the North to Irish Seas. The Leverhulme Trust-funded People and Place: The making of the kingdom of Northumbria 300-800 CE project is charting the funerary evidence from the late Roman and early medieval periods to investigate patterns of health, status, ethnicity, and lifestyle. The analytical and scientific analysis of the burial record allows an exploration of key questions related to the scope and nature of the migration period, the development of social identity, and how Northumbria expanded from a group of small polities into a large and powerful kingdom ruled by a series of dynastic lineages. People and Place is undertaking a full reassessment of all known funerary evidence from Northumbria using both published and unpublished data sources, museum archives, and the portable antiquities scheme. New osteological and paleopathological assessments of the skeletal evidence are refining the chronology of the funerary activity and are characterising the ethnic and social compositions of the regional communities of Northumbria. These results are being compiled into an integrated, multi-scalar GIS to analyse the datasets from a landscape perspective and investigating patterns in the populations and processes that formed the kingdom. This paper presents the preliminary findings of the project and how these results are beginning to reshape our understanding of the formative processes of this period.

06 MONUMENTAL IDENTITIES: FUNERARY LANDSCAPES AND SOCIAL CHANGE IN SOUTHERN ENGLAND AND THE NEAR CONTINENT, AD 400-900

Author: Dr Mees, Kate - Durham University (Presenting author)
Keywords: burial, landscape, early-medieval
Presentation Preference: Oral

Work on the Anglo-Saxon funerary landscape in a wider European context—particularly comparative research that brings together and fully integrates evidence from England and its nearest continental neighbours—has to date been relatively limited. While recent studies of early medieval material culture and settlement archaeology have demonstrated the value of a north-west European approach and intimated extensive mutual influence within this zone, scholarship on the mortuary landscape has tended to be regionally or nationally circumscribed.

This paper introduces a new project, funded by the British Academy, which aims to bridge this gap. It sets out to explore how communities on either side of the English Channel and southern North Sea conceptualised and modified the natural and cultural landscape through burial. At the core of the research is a comprehensive review of the corpus of funerary sites in an area that encompasses southern England, north-east France, Belgium and the Netherlands. As well as illuminating previously overlooked areas, it promises to elucidate a more global picture of the (re-)emergence of distinctive practices such as monument building and reuse, and to shed light on many of the foundational social processes of the Early Middle Ages.

The 'Funerary Landscapes' project builds on recently completed research, which examines the positioning of early medieval burial sites in Wessex, southern England—an area that initially spanned the apparent frontier between 'Anglo-Saxon' and 'British' influence. An approach is developed here for contextualising the burial record within the inhab-

ited landscape, taking into account patterns of movement, land use and cultural interaction. Presenting the results of this research, I discuss how nascent territories and group identities may have been forged and consolidated through burial practice and landscape appropriation.

07 1ST MILLENIUM ARISTOCRATS ON THE WEST COAST OF JUTLAND

Author: Head Curator Søvsø, Morten - Museum of South West Jutland (Sydvestjyske Museer) (Presenting author)
Keywords: GermanicIronAge, Jutland, Society
Presentation Preference: Oral

In recent years, metal detecting and rescue archaeology have become the hallmarks of Danish archaeology. Both activities produce vast amounts of data, but sadly the great majority of both the single finds and the excavations remains to be analyzed. However, the extent and number of both settlements and finds exceed any previous expectations.

Combining the different data sets with historical maps, place names and votive finds produce interesting patterns of long-term continuity regarding both social structures, demography and land use.

The paper argues that the pre-industrial agrarian society based on family-run farmsteads did not change much. A small village in the 5. C. was also a small village in the 18. C. Central places housing aristocrats in the 1st millennium later became Medieval towns.

Population numbers, however, did not seem to be stable but were directly linked to external factors like climate, conflict and disease. In times of growth, marginal areas were settled or migration took place and in times of recession, they were abandoned again.

It is suggested that population numbers in prehistory can be assessed when using big data such as large numbers of dendrochronological or C14-datings. When putting it all together, it seems that the 4th and 5th Centuries saw a peak in population and probably also migration followed by a dramatic decline due to the effects of the Late Antique Little Ice Age caused by volcanic eruptions in 536, 537 and 540.

08 SHINY GLASS FROM DISTANT SHORES. TRADE, SEAFARING AND SOCIETY ALONG THE NORTH SEA COAST IN THE MIGRATION PERIOD

Author: Dr. Segschneider, Martin - Lower Saxony Institute for historical coastal research (Presenting author)
Keywords: glass, trade, migrationperiod
Presentation Preference: Oral

Glass finds along the southern and eastern North Sea coast point to a well-established glass trade route around 500 AD, reaching as far as from the Rhineland via the Limfjord to Norway. Landing-places or beach markets like Amrum lay exposed at the coast, whereas the manors of wealthy rulers like Dankirke and Dejbjerg were situated some kilometers further inland. Obviously, both types of sites were interconnected. They can be described in more detail thanks to recent excavations. Putting the evidence together, a long-distance trade route system can be pointed out for a period, which otherwise is seen as a phase of depopulation and low settlement activity.

09 GERMANIC WORDS FOR AMBER AND THEIR ORIGIN

Author: Prof. Dr. Rübekeil, Ludwig - University of Zurich (Presenting author)
Keywords: Germanic linguistics etymology
Presentation Preference: Oral

The main topic of this paper are a couple of words denoting 'amber', which are transmitted by authors of Classical and Later Antiquity. These terms belong to a group of words which these authors label as Germanic. The majority of those words can indeed be traced to the attested Germanic languages, and they clearly derive from the contacts between the Germanic population and the Roman Empire. Some are only attested once, whereas others seem to have been borrowed and become more or less common Latin words. In some cases, the historical context of the transmission allows to locate the place of transfer of a lexical item more narrowly, and in a very few cases, there even is linguistic evidence about the area of acquisition. Concerning amber, the classical sources disagree if the Northern European amber was produced at the North Sea shore or on the Baltic Sea. The linguistic sources, however, give some hints, which have been overlooked so far. In my paper, I will try to line up the linguistic evidence with archaeological data and the testimonies of the classical authors. On a more general level, the paper thus contributes to an interdisciplinary discussion.

10 ABOUT THE ROOTS OF THE ROSETTE TWILLS AROUND THE NORTH SEA

Author: Dr Siegmueller, Annette - Niedersächsisches Institut für historische Küstenforschung (Presenting author)
Keywords: Textiles, Feddersen Wierde
Presentation Preference: Poster

Textiles have always been an important part of the daily life throughout the times. Nevertheless, they are an often ignored material group, mostly because of the rare conservation. Excellent conditions for the conservation of organic materials, especially animal artifacts, exist in the terps of the southern North Sea region clay district. Therefore the terp-finds include a high number of wools, textiles and fibres. These finds are current in the center of interest of new and specialized research. The best known piece of textile, a rosette twill, was found in the terp Feddersen Wierde, a roman period settlement near Cuxhaven. The pattern of rosette twill is very rare in Europe. Most of the as yet known examples were found in early medieval graves in Britain and southern Germany. The rosette twill from Feddersen Wierde is the oldest piece of this textile-type. The find from the Feddersen Wierde may give some new information about the circulation of textile knowledge and traditions. Further analyses on this find generated new acquaintance about the former colors and the production processes. Aim of the research-project is furthermore investigations on younger rosette twills. Moreover a comparison between all known artifacts will be the base for discussions about the origin of this rare pattern.

11 A VENDEL HELMET FROM FRIESLAND: THE EXPRESSION OF A SCANDINAVIAN IDENTITY IN THE PRE-VIKING NORTH SEA WORLD

Author: Dr. Nicolay, Johan - University of Groningen (Presenting author)
Keywords: Scandinavian, power, identity
Presentation Preference: Oral

The 4th- and 5th-century North Sea area saw major changes in population, political organization and the expression of group identities. The historically and archaeologically documented migration of Angles and Saxons (the so-called Anglo-Saxons) can be seen as the starting point of a fascinating process of power formation, in the 6th and 7th centuries resulting in rise of regional and larger kingdoms all along the southern North Sea. The elites of these kingdoms created political identities among their followers by distributing gold and silver ornaments as gifts. The execution of such ornaments at first was inspired by late-Roman belts, worn by officials of the still mighty Roman empire in the south. After this empire collapsed, however, the elite was in search of new symbols to express their status and the identity of the people they controlled. It is from now on that Scandinavian symbols are adopted, first as true imitations (e.g. neck rings and bracteates), later as regional-style ornaments (especially square-headed brooches). Most interesting is the conscious choice of this elite to continue using Scandinavian-style symbols, also when the Frankish kingdom developed as a new power block in the south. Instead of adopting Frankish symbols, especially in southeast England and the northern Netherlands the traditional, Scandinavian symbols were favoured – creating a cultural and religious border between the pagan/Scandinavian world in the north, and the aggressively expanding Christian/Frankish world in the south. Two terminal heads of a helmet bow, which belong to the first Vendel helmet ever found in Continental Europe, will be presented in this paper as new evidence for the expression of a powerful Scandinavian identity in the pre-Viking North Sea world.

143 ARCHAEOLOGY OF 20TH CENTURY ARMED CONFLICTS IN EUROPE

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author: Perez-Juez, Amalia (Spain) - BOSTON UNIVERSITY
Co-Author(s): Gonzales-Ruibal, Alfredo (Spain) - CSIC - SpainMorin, Jorge (Spain) - AUDEMA, SpainElia, Ricardo (United States) - BOSTON UNIVERSITY
Keywords: Conflict, Europe, 20th century
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The 20th century witnessed the cruelest and most devastating wars in the history of Europe. Countries were occupied, historical records destroyed, and archaeological sites manipulated to serve a political discourse. In some cases, there was a clear goal of deleting the memory of certain communities. From the two World Wars to the Soviet Revolution, from the Civil War in Spain to the Independence of Ireland or the War in former Yugoslavia, almost all territories in Europe have experienced an armed conflict during the 20th century. In the past two decades we have seen timid but increasing archaeological projects that deal with these events: documenting, excavating, investigating and preserving from battlefields to trenches. Not all countries in Europe have tackled these tasks in the same way. Some of them have made the study of their armed conflict a question of national identity. Others prefer to turn the page and ignore what happened. In this session we welcome papers from teams working on projects on armed conflicts in Europe in the 20th century. We will look at trends, policies, and whether we can find the best practices on how to deal with recent historic moments from an archaeological perspective.

01 BEYOND EXHUMATIONS: ARCHAEOLOGY OF 20TH CENTURY ARMED CONFLICTS IN POLAND

Author: Dr Kobialka, Dawid - Institute of Archaeology and Ethnology PAN (Presenting author)
Co-Author: Dr Kajda, Kornelia - Adam Mickiewicz University
Keywords: conflict archaeology, Poland
Presentation Preference: Oral

Archaeology of 20th century armed conflicts has recently been significantly developing in Polish archaeology. However, much of the research is devoted to the exhumations of Polish, Russian or German soldiers and civilians killed during the 20th century. Without any doubts, these exhumations are of social and cultural value for the Polish society. Nonetheless, archaeology of 20th century armed conflicts cannot be brought down just to graves. In our presentation, we offer an overview of the recent research trends within conflict archaeology in Poland. It is argued that new technologies (TLS – Terrestrial Laser Scanning, ALS – Airborne Laser Scanning) are helpful to sketch more complex, detailed, and sophisticated microhistories of the 20th century armed conflicts and their various material remains. Finally, we shortly discuss two case studies where TLS and ALS were successfully used to get a deeper insight into the local aspects of the First and the Second World Wars.

02 MOLUCCAN RESISTANCE IN THE NETHERLANDS: ARCHAEOLOGY OF GUERRILLA, PROTEST OR TERRORISM?

Author: MSc Wijnen, Jobbe - Wijnen Cultuurhistorisch Onderzoek (Presenting author)
Keywords: modern conflict
Presentation Preference: Oral

What is the role of conflict archaeologists in recent and partially unclosed conflicts? This paper discusses the proceedings of the 'Moluccan Heritage Project.'

As a result of the decolonization of the (former) Dutch East Indies, the independence of the Republic of Indonesia in 1949 and the proclamation of an independent Moluccan state in 1950, a large community of Moluccan soldiers serving in the Royal Netherlands East Indies Army became the plaything the complex political situation. As a result the Dutch government shipped 13.000 Moluccans, mainly military personnel and their families, to the Dutch mainland in Europe where they were demilitarized and housed in former Nazi Germany concentration camps. They were promised that they would be allowed to return to the Moluccan Islands shortly. However, this promise would be broken: The return never happened. As a result the Moluccan people's relationship to the Dutch state deteriorated vastly over three decades. A deep conflict developed, escalating the 1970ties in second generation violent outbreaks, train and school hijackings and killings, and in violent armed counterterror-measures by the Dutch state.

Today the landscape of Moluccan struggle for recognition is partially forgotten, still unrecognised as (possible) cultural heritage, and prone to unseen disappearance. In line with the international developments of contemporary archaeology, the 'Moluccan Heritage Project' reflects on the role of Dutch archaeologists - who are rarely if ever of Moluccan origin - in this process. Should these 'battlefields' be regarded as heritage in need of protection? Are they the remains of either courageous struggle against failing and degrading

Dutch policy, or the remains of plain terrorism? And what do the Moluccan communities think themselves? This paper discusses the proceedings of this ongoing experiment in Dutch archaeology.

More information (in Dutch): https://molukserfgoed.com/

03 ACTIONS TO KNOW AND TO VISUALIZE THE CONFLICT IN EXTREMADURA- SPAIN

Author: PhD candidate Perez Maestro, Carmen - Universidad de Alcala (Presenting author)
Keywords: Spanish Civil War,
Presentation Preference: Oral

We will discuss in our paper about the last actions that have been carried out to promote the knowledge and the visibility of the recent history in the "Campiña Sur" of Extremadura. These activities are part of a research project on civil war that has been taking place in the region since 2011. In one hand we focus our discourse on the archaeological work carried out in the military settlement named Punto de Mira and in the other, we will explain the process of setting up the first museum created in Extremadura focused on the Spanish Civil War.

04 'DIKSMUIDE REVISITED'. A CONFRONTATION BETWEEN THE ARCHAEOLOGICAL RECORD AND THE AFTERMATH OF THE FIRST WORLD WAR IN BELGIUM.

Author: Heyvaert, Bert - Group Monument; Conflict in contact (Presenting author)
Keywords: Belgium Diksmuide WW1
Presentation Preference: Oral

The experiences of Belgian soldiers in the trenches of the first world war lead to a heavily polarising political aftermath of this conflict. This paper wishes to look at the relation between this legacy and the archaeology of world war 1 in Belgium.

The legacy of the first world war left Belgium deeply divided. In 1914, the countries' dutch speaking majority was dominated by a francophonic bourgeoisie. This was highly reflected in the social structure of the Belgian army. The sense of injustment that was sparked during 4 years of static trench warfare, spread rapidly over the rest of Flanders after the armistice. It lead to outbursts of nationalism and violence throughout the rest of the 20th century and eventually paved the way towards a federal state.
All this casted a shadow over the war's aftermath and shaped the way in which the conflict has been researched and remembered.

Over the last 15 years, the vast potential of archaeological sites related to world war 1 became increasingly clear as a considerable number of sites were excavated. However, the focus has mostly been on the British army's front line near Ypres, while the Belgian army held a considerable part of the front region as well.
Only very recently, the Belgian army's front region started to receive more attention. This paper starts from these very recent archaeological projects in Diksmuide, the epicenter of the Belgian army's front line. For the first time in 60 years, remains of Belgian soldiers were recovered as the battlefield on which they fought a desperate battle in 1914 was being examined. Does the polarising aftermath of the war still affects the way in which these results are perceived 100 years later? And how did it affect the evolution of world war 1 archaeology in Belgium in general?

05 ALL QUIET ON THE HOME FRONT: RECORDING AND PRESERVING NON-BATTLEFIELD REMAINS

Author: Mr O'Meara, Don - Historic England (Presenting author)
Keywords: Archaeology, Concrete, England
Presentation Preference: Oral

The remains of 20th century armed conflicts can often manifest as landscape wide features. The physical evidence for battlefields, battlefield memorials, or shipwreck locations can be the most iconic evidence for 20th century conflicts. However, the passage of time can mean that ephemeral remains (often the concrete base for war equipment), logistic sites (including factories, prisoner of war camps, and supply depots), and defensive positions (from both air and sea borne attack) can seem of secondary importance to the sites of battles themselves in the public imagination. The presentation takes North-East England as a case study to examine how these sites are preserved, and what the key threats to their survival are. It argues that public engagement, rather than legislation is the key to preserving sites from periods which can be classed as 'historically saturated'. This region of England (from the Tees River to the Scottish border) preserves a range of 20th century military sites from the pre-World War I period to the Cold War. This presentation highlights the key threats to the preservation of these sites, and asks how they should be preserved in the historic environment at a time of when older monuments face their own preservation threats.

06 THE COMPLICATED QUESTION OF MEMORY IN SPANISH CIVIL WAR HERITAGE

Author: Dr PEREZ-JUEZ, AMALIA - BOSTON UNIVERSITY (Presenting author)
Keywords: Spanish-Civil-War, Heritage, Memory
Presentation Preference: Oral

The Spanish Civil War (1936-39) was followed by almost four decades of dictatorship that shaped what was taught and told of what had happened before, during, and after the war. An official history was written, memorials commemorating victories were constructed, and monuments to glorify the winners were erected. The memory of those who lost the war –and who represented the legitimate elected government- was either deleted or manipulated. The cultural remains of the Republican side were, for the most part, buried if not destroyed. Memory was constructed around one story and just one. The Democratic Transition (1975-1982) was done on the premise of "turning the page over" and therefore, accepted what was written. Four decades after the arrival of democracy, Spain is still dealing with the reality of the war and post war. Archaeology is shaping the new representativeness of that episode of Spanish history and archaeologists are dealing with the problem of what is and what is not heritage. This has numerous implications and affects preservation of remains, revision of data and of course, public understanding. The Spanish Civil War is still an unfinished question. This paper explores the current situation of heritage and memory related to Spanish Civil War from an archaeological perspective and aims to give a holistic insight into a war that still has too many questions to be answered.

07 "DURCHGANGSLAGER HANGÖ 1942-1944" - PERSPECTIVES ON THE CONFLICT ARCHAEOLOGY OF A SECOND WORLD WAR TRANSITION CAMP IN HANKO S. FINLAND

Author: MA Fast, Jan - University of Helsinki (Presenting author)
Keywords: WW2, conflict archaeology
Presentation Preference: Oral

In the early spring of 2014 I set up a meeting in Hanko (Hangö) with a group of archaeology students from the university of Helsinki and museum professionals from the museum in Hanko S. Finland. The purpose of the meeting was to discuss the possibilities of conducting conflict archaeological research of "Durchgangslager Hangö" a German WWII camp area at Tulliniemi (Tulludden), a cape at the southernmost end of Hanko and Finland.
The area was in the center of things from 1942 to 1944 when daily troop transports of thousands of German soldiers passed through it on their way to the northern front in Lapland or on their way home to Germany.
Part nature reserve and mainly used as the Freeport of Finland the area had remained closed to the public until the spring of 2014 when a nature trail leading to Uddskatan (the very tip of Tulliniemi) was opened.
Over the years of research the site has provided an opportunity to look at the archaology of the Second World War from a variety of different perspectives including memory history, photographic art and pedagogy.

08 JAPANESE CULTURAL PLUNDER DURING THE PACIFIC WAR: 1937–1945: UNRESOLVED ISSUES

Author: Professor Elia, Ricardo - Boston University (Presenting author)
Keywords: Cultural Plunder, Pacific-War
Presentation Preference: Oral

A great deal is known about the looting of cultural heritage in Europe by the Nazis during World War II. There is substantial documentation of Nazi cultural plunder: We know who directed it, which agencies of the government and military carried it out, what was taken, and where. Millions of looted cultural objects were located and restored after the war. The case of Japanese cultural plunder during the Pacific War is different. Although it is often stated that Japanese looting was systematic, state-sponsored, and conducted on a scale rivalling the Nazi plunder, unlike the Nazi looting, there has been little study of the subject and not much is known about the scale and scope of Japanese cultural plunder or the methods used to acquire cultural objects. Relatively few cultural objects looted by the Japanese were ever returned to countries that were occupied by the Japanese military. As a result, countries that suffered serious cultural losses at the hands of the Japanese, especially China and Korea, continue to harbor resentment against Japan to this day and this unresolved issue from more than seven decades ago still affects political relationships with Japan in East Asia. In this paper, I survey the nature and extent of Japanese cultural plunder in the Pacific War, with special attention given to the various means by which the Japanese appropriated cultural objects from the countries they occupied during the war.

09 REWRITING WAR EPISODES: THE BATTLE OF TOLEDO REVISITED USING A MULTIDISCIPLINARY METHODOLOGICAL APPROACH

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Keywords: Spanish-Civil-War, Methodology, Battlefields
Presentation Preference: Oral

For years, almost all bibliography produced about the Spanish Civil War in Toledo (Spain) had only one focus: the siege of the Alcazar in 1936, which was used as a symbol of Nationalistic resistance. In the past few years, we have been revisiting this episode of Spanish Civil War by studying the landscape of the city and surroundings. For this project, we have developed a methodology that includes traditional archaeology as well as non-invasive techniques: survey, test pits, use of drones, GPS, photogrammetry, written sources, photography, etc. Thanks to this holistic approach we have been able to better understand a part of the war that actually lasted for three years, and that shed light on the participation of different European countries in the Spanish Civil War, a prelude of what would be Second World War. This paper presents the results of our research, showing new data about war techniques and weapons used in Europe in the thirties and forties, as well as explains this new methodological approach to the study of battlefronts and battlefields immersed in an extended landscape

144 ARCHAEOLOGY AT SITES OF PROTEST, RESISTANCE AND COMPLIANCE

Theme: 6. Interpreting the archaeological record
Author: Theune, Claudia (Austria) - University of Vienna
Co-Author(s): Dézsi, Attila (Germany) - University of HamburgMcAtackney, Laura (Denmark) - Aarhus University
Keywords: contemporary archaeology, protest, civil disobedience
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

MERC
Medieval Europe Research Community

Recent contemporary archaeology has dealt intensively with research on key sites of major conflicts especially the World Wars and the Cold War. Less attention has been paid to places where civilian and social protest are manifest, including against military rearmament, industrial exploitation, pollution, gender inequality, or where there is evidence of civil disobedience and resistance against state arbitrariness and regulations; protest which ends in strikes, resistance against state affiliations or sometime violent rebellion against totalitarian regimes.
Such a protest, resistance and even compliance can manifest itself in material relics. Various archaeological investigations have already taken place on such sites. Partly the protest and resistance belong to the past, the archaeological investigations have an historical dimension that serves the memory and the relics are already mediated, safe and musealized. In other cases, the protest is ongoing, so the archaeologists are either physically excluded or included as actively participating observers and researchers in the protest.

The aim of the session is to discuss archaeological research at sites of civil and social protest, disobedience, rebellion, resistance and compliance. It looks interpret the materiality of violent confrontation with the state authorities, how it is contested, negated or suppressed, and the role of the archaeology and archaeologists in uncovering these often hidden realities. These sites have a high potential in creating complex and nuanced understandings of society; in facilitating very different narratives of the 20th and 21st century, beyond official historiography. Archaeology can uncover such contradictions and enable the commemoration of the protest.

01 ALT HERITAGE: HIPPIES, SQUATTERS AND RAVERS AFTER THE POLICE AND CRIMINAL JUSTICE ACTS 1984, 1994.

Author: Dr. Hoaen, Andrew - University of Worcester (Presenting author)
Keywords: Post work communities
Presentation Preference: Oral

During the later decades of the twentieth century a series of post work utopian movements sprang up across the United Kingdom. Mostly comprising young people, they were united by unemployment, music, squatting, free festivals and raves. Whilst not traditionally political, these people were often involved in political action and embraced a diverse set of causes such as the Greenham Common anti-nuclear protest.
At their height, these movements were able to grow large alternative communities both in the countryside and in the city. The members of these movements were interchangeable and could be found in the countryside as the "Convoy", whilst in cities such as Manchester and London, council estates were squatted.
The Conservative governments of both Margaret Thatcher and John Major were prepared to employ large numbers of policemen and army personnel (1500 police and soldiers were used to evict the peace camp at Molesworth common), together with increasingly repressive legislation to restrict and control these movements (Police and criminal Justice Acts, 1984, 1994, and the Public Order Act 1986). Finding their access to the countryside reduced many travellers both traditional and new found refuge in the squatted estates in the cities, eventually leading to councils' losing control of these areas. To solve this problem many councils then demolished these estates. This social cleansing involved the demolition of thousands of homes, and the rehousing of thousands of people.
As an active participant in both the free festival and squatting movements of the eighties and after, I have been conducting a series of experiments as to how best to record and interpret archaeologically what was an ephemeral counter culture. In this paper, I will compare and contrast how the living culture and heritage of these groups compares with the efforts of academics to understand and document their protest.

02 'LOW COST' ARCHAEOLOGY IN POST-CONFLICT BASQUE COUNTRY: THE GROUP OF SOCIAL ARCHAEOLOGY (GAS)

Author: 'LOW COST' ARCHAEOLOGY IN POST-CONFLICT BASQUE COUNTRY: THE GROUP OF SOCIAL ARCHAEOLOGY (GAS) Santamarina-Otaola, Josu - University of the Basque Country (UPV-EHU) (Presenting author)
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Keywords: Low Cost Post-Conflict
Presentation Preference: Oral

The Group of Social Archaeology-GSA (Grupo de Arqueología Social, GAS) was formed in Vitoria-Gasteiz (Basque Country) in May 2015 with the aim of enabling a process of collective reflection on the potential of archaeology as a tool for social and political transformation for local communities. Over the last two years, GSA has engaged with a variety of current social problems, articulating its initiatives by means of a website, a radio programme, social media and low-cost archaeological projects. In particular, GSA has focused on the study of the traumatic spaces of Basque contemporary history, addressing the materiality of Francoist dictatorship, heteropatriarchy, working class struggle, and, more recently, political conflict and violence. In this regard, one of the most prominent subjects has been the study of the (post)conflict landscapes that have emerged since ETA announced a permanent ceasfire in October 2011. In this paper we will present the different initiatives that we have developed so far and outline further lines of debate for future interventions. The use of a variety of methodologies, such as small-scale archaeological and historical research, artistic and archaeological performances and free touring visits has enabled us to engage local communities and unveil the multiplicity of discourses that are ignored by, and sometimes contest, the official narratives of the conflict and its afterlife. This argues for further comparative reflection on the potential of archaeology and the study of the materiality of everyday life and quotidian spaces as a means for debate and mediation in post-traumatic contexts.

03 HISTORICAL ARCHAEOLOGY AT SITES OF PROTEST: CRITICAL AND COMMUNITY ARCHAEOLOGY AT THE "FREE REPUBLIC OF WENDLAND"

Author: M.A. Dezsi, Attila - University of Hamburg (Presenting author)
Keywords: Hisorical arcaeology, protest
Presentation Preference: Oral

The PhD project focuses on an iconic late twentieth-century event of the German anti-nuclear movement in May 1980. More precisely the protest camp against a nuclear waste disposal facility: the so-called "Freie Republik Wendland". Its 2.000 inhabitants, both farmers and activists, shaped the political discussion about sustainable energy production in Germany and Europe. After 33 days, the village with 120 huts was forcibly dismantled. The buildings (e.g. the hospital, women's safe place, kitchens and the big meeting house) were destroyed by police to make place for a test drilling for the facility.
Multiple sources are available for the analysis of the event and associated commemorative culture. In a multi-source approach, written sources, photographs as well as oral history are interpreted in a comparative perspective.
The site's state of preservation and the material remains of the large-scale camp will be assessed. The features from huts of different interest groups and purposes will be compared. In this way, everyday material culture as well as the camps internal structure and possible conflicts within the community could be traced.
The contemporary witnesses and locals will be fully integrated the overall PhD project through public participation at several project steps (field-walking, excavation, interviewing and collaborative interpretation). The approach does not only provide new methodological insights for the interpretation of late twentieth-century sites and artefacts, it also enables the public to participate in archaeological fieldwork and post-excavation analysis.
The work is situated in the field of Critical Archaeology, which discusses the materialization of social contradictions. It aims to transform the place of ongoing conflict (the region is still being actively considered as a possible location for nuclear waste disposal) into a place of remembrance and heritage. Not only does this increase scientific knowledge, it also reflects on the role of archaeology in modern society.

04 THE NEGOTIATED REALITIES OF POLITICAL IMPRISONMENT IN 20TH CENTURY IRELAND

Author: Dr McAtackney, Laura - Aarhus University (Presenting author)
Keywords: prison, resistance, compliance
Presentation Preference: Oral

The study of institutions have been long included in the archaeological canon as worthy of contemplation through a number of theoretical and methodological frameworks. A Foucauldian approach of exploring the material structures of the institution with a focus on its perceived aim to control and curtail the experiences of its occupants has been influential. However, there has been an increasing interest in how inmate resistance can be traced through locating interactions with their enforced material worlds. This paper aims to bring together the two perspectives in order to argue the prison should be read as negotiated place of both control and compliance but also of protest and resistance across time and space. Using the case-studies of Kilmainham Gaol in Dublin and Long Kesh / Maze prison in Belfast this paper will explore the negotiated realities of the political prisoner and their relationship not only with the building that confined them but the often forgotten regime that activated or negated the potential of the structure. In doing so this paper will argue that it is most useful to explore institutions as not simply material environments where function follows form, or places of passive compliance/active defiance, but as changeable, negotiated places that contained interactions and intentions by a number of stakeholders thereby ensuring they were dangerously, constantly in flux.

146 3D TECHNOLOGIES IN ARCHAEOLOGICAL DOCUMENTATION, ANALYSIS AND INTERPRETATION

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Bertaud, Alexandre (France) - Ausonius Institut, University Bordeaux Montaigne
Co-Author(s): Pakkanen, Jari (Finland) - Finnish Institute at Athens; Royal Holloway, University of London
Keywords: 3D-Technology, Recording, Analysis, Interpretation
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Archaeology has been for several decades at the forefront of digital humanities and the use of sophisticated software is a standard feature of archaeological projects. The role of 3D-applications in the documentation has seen a steady rise in the recent years, and they are becoming vital tools during the excavations as well as analysis and interpretation of archaeological data. The 3D-software tools can enable faster and more precise recording of the remains, but their use should not only be limited to archaeological recording and presentation: computer applications can play an important role in analysis and interpretation, and they can potentially lead to a better understanding of the time-dimension of the materials.

The papers of the session will be presenting the current use of 3D-technologies in the documentation of archaeological material. Different contexts give rise to the use of different methodologies, and the case studies can be used to map the possibilities and needs of the future. This session will also provide an opportunity to present and discuss the different uses of 3D-tools to analyse and interpret the archaeological record. 3D-modelling can provide complete new fields of investigation to researchers. Data can be analysed in new ways and different work hypotheses can be formulated: the 3D-tools permit work-in-progress manipulation of the archaeological record and testing different hypotheses. The papers should give an understanding how these case studies are related to the wider discussion of the use and importance of 3D-technologies in archaeological analysis and interpretation and its future in archaeology.

01 COMBINING INTENSIVE TOTAL STATION DRAWING AND PHOTOGRAMMETRY IN ARCHAEOLOGICAL FIELDWORK DOCUMENTATION

Author: Dr Pakkanen, Jari - Finnish Institute at Athens and Royal Holloway, Univ. of London (Presenting author)
Keywords: 3D-documentation, photogrammetry, line-drawing
Presentation Preference: Oral

Recent advancements in information technologies have already resulted in three-dimensional documentation of architectural and archaeological features being commonly used in a very large number of fieldwork projects: new developments in hard- and software are fast replacing traditional ways of recording and draftsmanship. Even though laser scanning is still beyond the budget of most projects, digital photography and three-dimensional recording using total stations are standard pats of fieldwork documentation. The most cost-effective way of producing precise two-dimensional line drawings is combining photogrammetry with intensive stone-by-stone documentation using reflectorless total stations: the two-dimensional projections can be produced to any required direction (plans, elevations, sections). The benefits of the presented method include speed of production, higher measurement density and precision compared to hand-made drawings. These all allow for more time to be used for the actual study of the documented features. For large complexes drone photography can shorten the time needed in the field and a case study of underwater archaeological documentation based on aerial photography and total station drawing of the ancient and medieval harbour at Kyllene will be discussed in detail. Full three-dimensional documentation of existing features allows also for reconstructions which fit the data better and facilitates subsequent analyses of the architecture. The Finnish Institute at Athens annually trains students without previous experience of archaeological documentation in short field courses to be experts in using the method. Further presented examples are derived from ongoing fieldwork projects of the Finnish Institute.

02 3D MODELLING OF COMPLEX SITES IN ARID ENVIRONMENTS: DATA CAPTURE, PROCESSING AND ANALYSIS IN THE ATACAMA DESERT

Author: Parcero-Oubiña, César - Instituto de Ciencias del Patrimonio (Incipit), Spanish National Research Council (CSIC) (Presenting author)
Co-Author: González Rodríguez, Cristián - Freelance Archaeologist; Murphy, Beau - University of New Mexico
Keywords: Atacama, Prehispanic, settlement
Presentation Preference: Oral

The Atacama Desert has been historically an area with a very low density of human settlement, basically due to its extreme environmental conditions (aridity, altitude). But these environmental conditions have also permitted an extraordinary degree of both preservation and visibility of the ancient constructions in the landscape. Taking advantage of that, the use of aerial images for archaeological prospection is here even more fruitful than in temperate or tropical regions. And this includes the ability to create accurate 3D models of large and complex sites that can be used to analyse them in different ways. In this paper we will present the process of creation of a highly detailed 3D model of the site of

Turi, the largest Prehispanic settlement in the Atacama, based on low altitude aerial images taken with a UAV. We will describe the processes of data capture and processing to achieve a final result, as well as some preliminary results of the analytical approaches to the site that the 3D model is making possible.

03 THE ANALYSIS OF ANCIENT MONUMENTS BETWEEN TRADITION AND INNOVATION: THE CASE STUDY OF THE FOUR SMALL TEMPLES AREA AT OSTIA

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Keywords: Ostia, survey, reconstruction
Presentation Preference: Oral

The Four Small Temples area is located in the II Regio of Ostia and it is bounded to the south by the so - called decumanus maximus, on the east by the theatre and the Piazzale delle Corporazioni, on the north by a non-excavated area and on west by the Grandi Horrea. The main part consists in four temples, which are placed on a single basement, in the Domus of Apuleius, located in the north-east corner, and in the Mithræum of the Seven Spheres, on the north one. A supposed industrial structure is set on the west part of the area and few tabernæ overlook the decumanus. Buildings with different functions, including the sacred, commercial and residential one, therefore are juxtaposed in a restricted and clearly defined space; various types of masonry and different grade planes suggest the existence of several phases of construction from the republican era to the late antiquity.
From a methodological point of view, the research in such a complex area necessitated the integration of archaeological and topographical discipline classical methods with the most advanced survey technologies.
In particular, the archival data of the excavations conducted by R. Lanciani between 1885-1886 and by D. Vaglieri between 1911-1913 in this area have been integrated with those from the laser scanner survey of the entire zone: the pointcloud, combined with the photogrammetric survey of more diagnostic parts of the buildings, has allowed a new technical analysis of the remains.
The synchronic and diachronic three-dimensional reconstruction of the area, finally consented to shed light on its monumental development; moreover, it clarified the functional and architectural relations among the different buildings and the impact that the construction of the nearby theatre had on the usability of this part of the city.

04 THREE DIMENSIONS IN A TROPICAL FOREST. THE COLONIAL PLANTATION LA CAROLINE IN FRENCH GUYANA

Author: Mackiewicz, Maksym - Institute of Archaeology, University of Wrocław; Archeolodzy.org Foundation (Presenting author)
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Keywords: French Guiana, 3D
Presentation Preference: Poster

Successful fieldwork in a tropical forest requires both a comprehensive preparatory scenario as well as a framework of everyday methods. Dense vegetation impedes navigating the terrain and interpret the relations between the anthropogenic and natural landscapes. Additionally, the forest hampers using accurate measurement systems. It hinders the logistics, effectively limiting the amount of equipment that can be used.
Parts of the colonial plantation La Caroline were excavated in 2016. Located 30 km from Cayenne near the river Mahury, it was active since the end of the 18th century until the 1870's. Cloves and rokou were its main crops. It had a regular, somewhat iterative layout. The remains of some buildings, e.g. the maisons de maître, a free-standing kitchen and slave or labourer quarters are still discernible. A monumental stairway leading down to a now defunct canal and road system is also preserved. Today, the whole area is covered with a tropical forest and the building remains are hidden in thick undergrowth.
Airborne Laser Scanning was conducted during the preparatory stage. This allowed to create accurate land relief and use models. It encompassed several adjacent plantations and revealed the spatial layout of buildings, elevated fields, roads and other infrastructure. ALS and fieldwork data provided the basis for models of La Caroline: first, temporary in 2.5D GIS and then a more precise one, in 3D
Image-based modelling was utilised during the fieldwork. This allowed to save time spent on documentation and provided high resolution data. Photogrammetric techniques were used primarily to record architectural remains. This, in addition to comparative studies of similar structures, allowed us to model, reconstruct and visualise the buildings in 3D.
The 3D imaging is successively uploaded online as visually attractive interactive models. As such, they promulgate not only our results, but historic archaeology in French Guyana as well.

05 TRANSFORMING STRATIGRAPHY INTO 3D SHAPES: SCRUTINISING A NEOLITHIC HOUSE

Author: Vágvölgyi, Bence - Hungarian Academy of Sciences, Research Centre for Humanities, Institute of Archaeology (Presenting author)
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Keywords: Architecture GIS Photogrammetry
Presentation Preference: Oral

As part of a research project that explores later 6th millennium cal BC Neolithic settlements in western Hungary, the excavation of a building has been started in Tolna-Mözs in 2016. Although thousands of Linearbandkeramik culture houses have been excavated all over Europe, plenty of details such as possible internal floors and deposition processes of the longpits flanking houses remain virtually unknown. The intention was not only the exploration of structural elements and processes, but also an experiment in micro-stratigraphic fieldwork- and documentation methods. Layers were uncovered to the smallest detail to complement the archaeological record from an earlier large-scale excavation of the settlement. Although both the fieldwork and the data processing is still in progress, the available amount of information is suitable for substantial steps towards a reconstruction of the story of the house.

In order to be able to interpret such a complex dataset, we needed a method that could provide further information beyond an average field documentation and the matrix of the stratigraphy. We chose 3D Photogrammetry as the solution to this task, which has already proven to be flexible enough for field deployment, while also capable of producing accurate datasets that can form the basis of a 3-dimensional GIS database containing every layer of the site. The presentation aims to present our workflow for creating such a database, while also sharing lessons learned and results obtained from our experiments with this technology in the context of a highly detailed excavation.

06 THREE-DIMENSIONAL RECONSTRUCTIONS FROM AERIAL PHOTOGRAPHS OF THE MEGALITHIC TUMULUS OF CAMPA SAN JUAN DOLMEN (ASTURIAS, SPAIN).

Author: Mr. Busto Zapico, Miguel - PhD Student. Ficyt Foundation. Department of Art. University of Oviedo
Co-Author: Dr Rodríguez del Cueto, Fernando - Assistant Lecturer. Department of History. Area of Prehistory. University of Oviedo (Presenting author)
Keywords: 3D, Neolithic,Iberia
Presentation Preference: Poster

New instruments and software are producing radical changes in the way in which archaeologists can gather information and create a site record. Photogrammetries are part of these new techniques that provide very accurate records. That is why these tools were applied during recent excavations carried out in the Neolithic tomb of Campa San Juan (Salas, Asturias). This archaeological site was dug for the first time last summer as part of a research project funded by the Valdés-Salas foundation. All the data recovered will allow us to develop several research lines which will enable a deeper understanding of the prehistoric structure.
Regarding photogrammetries, a group of photos were taken during excavations with the goal of developing 3D models with Agisoft Photosocan software. As a consequence, eleven models were created along this year. These models constitute a parallel record of the excavation, providing very precise shortcuts to data. In this way, sections, measures and other information that have always disappeared after diggings, remain available.
But, on the other hand, photogrammetries during the excavation process were complemented with a brief aerial survey made with drones. This technology will allow us to create a specific record from the air. Thanks to the overlapped photographs that were taken, it is also possible to have a three-dimensional reconstruction of the tumulus. These monumental architectures have always had a deep impact on the Asturian landscape, and the 3D models can be crucial to calculate the dimensions and volume of the prehistoric structure in an exact and efficient manner. Besides, more information can be included in the site record: not only the stunning views provided by the drone but also the precise topographic references taken during the flights. Apart from this, three-dimensional reconstructions can facilitate the explanation of the monument to the public in a simple way.

07 USING 3D TECHNIQUES TO CAPTURE AND PROCESS THE VOLUMETRIC DATA OF MEGALITHIC CONSTRUCTIONS BY USING DRONES AND 3D TABLET

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Keywords: 3Dtablet, drones, volume
Presentation Preference: Oral

The systems and techniques for capturing and processing data in archeology have greatly evolved in recent years. Currently, geographic information systems, satellite images, scanners, drones, three-dimensional representation systems, and cameras and video cameras that capture in a high resolution quality, have become an essential way of documentation and development in the new lines of prehistoric archeology research.
The present communication is focused on a research project about the megalithism on the north-east of the Iberian Peninsula using some of these innovative applications. The aim is to create a 3D model of the built spaces of the megalithic tombs (room and corridor), to calculate its volume and propose models based on the estimation of the investment of work needed to build a construction of such dimensions and weight.
For calculate the volume we use two techniques in order to evaluate which one is more useful, fast, accurate, valid and reliable to estimate the volumetric data of the build spaces. Thus, first we capture images using drones. These images are then treated with specific software for creating three-dimensional models to obtain the required data. Alternatively, we use a 3D tablet; equipment composed by a depth camera (Kinect) and a CMD infrared sensor. The comparison of the results obtained by both techniques allows us to evaluate the usefulness of each one currently.

08 WHAT DO THE STONES SAY? – 3D DOCUMENTATION AND ANALYSIS OF SHEPHERD STONE SHELTERS IN KRAS, SLOVENIA

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Keywords: 3D documentation, architecture
Presentation Preference: Oral

"Hiška" (also "šiška" or "kutja") as local people call it, translates to "a small house". These small houses were built out of local stone without any binding material and were used as a shelter for shepherds. Such constructions are not unique to the Kras region (Slovenia) as similarly-built structures are known in the northern Mediterranean area, stretching as far as Britain on the one side and the Near East on the other. Nevertheless, hiškas of the Kras region represent their own branch of dry-stone constructions and despite their long tradition (the dating is many times very difficult, if not impossible), today they stand hidden in the forest condemned to deteriorate. In recent years several initiatives were taken to promote this type of cultural heritage, however, a lot still needs to be done.
As part of an ongoing PhD research several of those Kras hiškas were geometrically recorded in 3D using an image-based modelling (IBM) approach with the main aim to use and test the collected 3D models not only for documentation and presentation purposes, but also to investigate their value as an archaeological research tool. The IBM documentation itself was a challenging task, as hiškas are normally located in a low-vegetation forest which makes it difficult to locate and properly photograph them. After their generation, the 3D models were used to compute their stone volume (to estimate the house's construction time) and for rain and sunshine simulations to assess the functionality of different types of hiškas.
Such 3D models and approaches undoubtedly open new doors to archaeological interpretation, however, the collaboration between archaeologists and computer scientists needs to be further strengthened to truly increase the usability and archaeologically-relevant application of such 3D surface models.

09 3D RECORDING VS TRADITION: A FIELD ARCHAEOLOGIST POINT OF VIEW

Author: Phd Pintucci, Alessandro - Sapienza University of Rome; Topografia Archeologica Scarl (Presenting author)
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Keywords: photogrammetry, field-archaeology, survey,
Presentation Preference: Oral

Over the past 15 years, 3D survey techniques have made great strides and have quickly become available to a growing number of professionals and to public and private archaeological organizations. In addition to traditional archaeological survey techniques and structural analysis of the ancient complexes, in which the school of Ancient Topography of

Sapienza University of Rome has been for a long time one of the most advanced research and teaching centers, innovative and promising techniques of representation, even if not without contradictions, have been joined.
Since 2008, the deep global economic crisis has imposed sizeable budget cuts in the humanities, including archeology. In this context, the purchase of software and hardware tools for 3D survey must deal with the great difficulty in getting a satisfying return on investment; in this sense, the automatic photogrammetry, combined with more traditional survey systems, represents a good compromise between quality of representation, metric and morphological fairness and economic investment.
Based on case studies from contexts of Rome and Latium the two authors, both Phd in Ancient Topography and Survey and both freelance, will try to address some issues raised by the use of these systems: the risks associated with the progressive detachment from archaeological materiality, the rapid changes in technology and the obsolescence of the tools, the lack of interoperability and the risk of obsolescence of the formats, the need to adapt the forms of scientific publications to the new media, overcoming the graphics standards born at a time of purely analog representation.

10 POTENTIALS OF A 3D APPROACH FOR MICROWEAR ANALYSIS ON FLINT ARTEFACTS

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Co-Author: Fiers, Géraldine - Ghent University; Dr. De Kock, Tim - Ghent University; Messiaen, Liesbeth - Ghent University; Vandendriessche, Hans - Ghent University; Prof. Dr. Cnudde, Veerle - Ghent University; Prof. Dr. Crombé, Philippe - Ghent University
Keywords: microwear, 3D, flint
Presentation Preference: Oral

There is an increasing number of studies that apply different kinds of high resolution imaging techniques such as SEM (Goodale et al., 2010) and laser confocal microscopy (Ibáñez et al., 2014) in the context of microwear analysis of lithic artefacts. Research on the effects of weathering to microwear traces has a history of a few decades (e.g. van Gijn, 1984). However the combination of these two research topics is hardly explored yet. Our research project aims to study the effects of weathering processes, such as patination and burning, on the preservation of microwear traces by exploring new and non-destructive 3D techniques.
Microwear traces are one of the most important indications of the use of archaeological tools, therefore crucial in our understanding of technologies and life in the past. However, microwear analysis is a non-quantitative method, mainly based on comparison with experimental tools. Research latterly focus on methods that can help to quantify the microwear traces. A first goal of our project is the quantification of the microwear traces on experimental lithic tools and prehistoric artefacts.
Experimental lithic tools are analysed in blind tests using the traditional and more state-of-art microscopic (high-power) technique. In the next phase, this microwear analysis will be repeated after laboratory induced weathering. The possible use of different 3D techniques will be tested in both phases. Comparison of the results will lead to the development of an adapted protocol for registration of microwear and weathering traces. The characterisation protocol will subsequently be applied on prehistoric artefacts from sites that belong to the transitional period of Final Mesolithic-Early Neolithic of the Scheldt valley in NW Belgium.

11 GESTURES OF THE WARRIORS: 3D MODELLING OF WARFARE ARTEFACT FROM THE WESTERN EUROPE DURING THE LAST CENTURIES BC.

Author: Dr Bertaud, Alexandre - Ausonius Institut, University Bordeaux Montaigne (Presenting author)
Keywords: Weapon, gesture, 3D-reconstruction
Presentation Preference: Oral

The fighting position of warriors, the gestures associated with a particular fight have firstly been analyzed through the textual sources. But the textual data are scarcer about late prehistorical warriors, with a questionable objectivity. With the development of the typochronological approaches about weaponry, we can apprehend, in an archaeological way, the use of the weapons. Their association allow us to approach the tactics of these warriors. This point of view was based on the morphological aspect of the artefact and the possibilities offers by each weapon.
With the development of new technologies, especially associated with 3D-tools, we can approach the gesture issues in warfare context in a new way. The 3D modelling tools allow us to reconstruct the original form of the weapons without the rust and eventually the vanished materials. With the reconstructed 3D form, we can now question the models on different issues to understand the gesture of the ancient warriors. The 3D model is much more flexible to test hypothesis than the real reconstructions.
Furthermore, the analysis of the warrior gesture associated to different weapon allow us to understand the ways of weapon exchanges and adoptions. These adoptions of foreign weapon can be associated with a fighting similarity that can't be observe in a typological approach as we can see for the latenian sword in the Spanish Meseta and the roman gladius.
In this paper, we will present a methodological analysis based on 3D modelling to understand the warfare practices, the warrior gestures and so, to understand in a better way the mechanisms of tactical modifications during the last centuries BC.

12 3D, VOLUME, AND WEIGHTS. PHOTOGRAMMETRY APPLIED TO STUDIES OF ANCIENT WEIGHING

Author: Poigt, Thibaud - University Toulouse Jean Jaurès; University Bordeaux Montaigne; EHEHI - Casa de Velázquez (Presenting author)
Keywords: photogrammetry, weights, metrology
Presentation Preference: Oral

Nowadays, the photogrammetry is strongly integrated in the archaeological sciences as a powerful tool for 3D graphic documentation. However, the potential of this method is greatly underestimated and often reduced to a visual support illustrating field results or to the production of orthographic pictures. Digital photogrammetry is characterized by the computation of 3D models from 2D pictures, in other words the extrapolation of volumetric measures from images. This metrological approach is barely considered in archaeology or limited to length or area measures.

In the same time, studies of ancient weighing face a major issue since many years: the bad conservation of scale weights. In many cases, we found them partially conserved and sometimes modified. Theoretically, it is an easy issue to solve. With a restitution of the missing part and a rather simple calculation (volume x density), we can estimate the mass

of the degraded fragment. The main problem is to calculate the volume of our artefact, the principle of fluid displacement, which supposes immerging the object in water, being barely applicable to archaeological objects.

This paper will propose an application of photogrammetry to solve issues of volume measurement and restitution of broken scale weights. This protocol resolves the main problems linked to this kind of material: 3D digital models provide a strong accuracy in volume measurement, they do not necessitate much manipulations of the artefacts themselves and they allow for swift, virtual, experimentation.
Combined to modelling process, photogrammetry allows for innovative data processing, in a way which was impossible a few years ago, thus opening new paths for interpretation. This paper will provide an overview of the methods developed in the framework of an ongoing PhD, as well as an assessment of their reliability and of their heuristic potential.

13 WORN BUT NOT FORGOTTEN: DIGITAL TECHNIQUES IN THE ANALYSIS OF THE EARLY MEDIEVAL SCULPTURE OF GOVAN, GLASGOW

Author: Kasten, Megan - University of Glasgow; Glasgow School of Art School of Simulation and Visualisation (Presenting author)
Keywords: reconstruction, RTI, photogrammetry
Presentation Preference: Oral

This paper will explore how three-dimensional technologies can contribute to the analysis of early medieval carved stones. While three-dimensional techniques are utilised in archaeology for the purposes of recording or publishing purposes, this overlooks their analytical potential. The remarkable collection of sculpture found at the Govan Old Parish Church in Glasgow, Scotland, currently consists of a sarcophagus, four cross-shafts, five hogbacks, and twenty-one recumbent cross-slabs that range in date from the 9th to 10th centuries AD. While the recumbent cross-slabs make up the largest proportion of the collection at this site, they have been largely ignored due to their physical condition and the unique quality of the other monuments. Most of the Govan recumbent cross-slabs exhibit a great deal of damage, and some have been worn to the point that their original ornament is no longer recognisable. In past analyses of these monuments, many of these particularly worn monuments were not considered.
As a part of my PhD research, I have developed a methodology to reconstruct several of the Govan stones which involves the use of both Reflectance Transformation Imaging and photogrammetry. RTI is a digital technique that offers insight into the structure of the surface of the monument and aids in the identification of carved or pecked areas. By identifying these remnants of decoration on the worn stones and the creation of a three-dimensional comparative collection of known decorative motifs from the better-preserved examples of the Govan collection, it becomes possible to reconstruct the ornament which was once found on the worn stones. Through their reconstruction, these once-sculpted stones can be brought into the conversation and can contribute to future interpretations of the Govan collection.

14 A 3D REFERENCE COLLECTION OF WHEEL-FASHIONED POTTERY

Author: MA Opgenhaffen, Loes - University of Amsterdam (Presenting author)
Keywords: 3D-scanning, algorithm, pottery-analysis
Presentation Preference: Oral

3D technologies can support in addressing queries that cannot be answered through traditional methods, and could acquire truly new information that enable the archaeologist to get one step closer to the past. In this paper, I will show how archaeologists could deploy 3D techniques as a valuable research tool in the analysis and interpretation of ancient technologies and innovations, in this particular case Aegean Bronze Age wheel-fashioned pottery.

The several forming methods of wheel-fashioning left their (macro-) traces in the topography of the pottery, but these are very hard to discern with the naked eye. In order to recognise the presence (or absence) of wheel use in pottery assemblages, I will closely observe how an experimental archaeologist simulates the incremental process of the production process of wheel-coiled and wheel-thrown pottery. The translation of the analysis of this experimental production, will set the parameters which will be translated in an algorithm. This algorithm should subsequently be able to automatically identify the wheel-fashioning method in archaeological pottery assemblages, and could therefore be a valuable addition to the 3D toolset of the archaeologist.
To train and test the algorithm, the experimental pottery will be recorded with 3D scanners and stored in a custom made database. Each 3D model will be annotated with manufacturing data and descriptions of its macrotraces. This will form the basis of an open access 3D reference collection of wheel-fashioned pottery. To conclude, 3D technologies are able to execute most accurate analysis of features, which are of crucial importance for assessing different ancient fashioning techniques, technological choices, as well as the transmission of new innovations such as the potter's wheel.

15 3D IMAGING, VIRTUAL AND AUGMENTED REALITY TECHNOLOGY: OPENING NEW INTERPRETATIONAL AVENUES FOR ARCHAEOLOGICAL ARTIFACTS.

Author: Assist.Prof.Dr. Bozia, Eleni - University of Florida (Presenting author)
Co-Author: Ass. Prof. Dr. Barmpoutis, Angelos - University of Florida
Keywords: 3D, augmented reality
Presentation Preference: Oral

This presentation discusses traditional archaeology within a new context in a twofold manner: 1. It focuses on the Digital Epigraphy and Archaeology project and its accommodation of 3D data. 2. It discusses the need for physicality that is lacking in 3D modeling and the adoption of advanced technologies, such as virtual and augmented reality displays, to resolve this issue.

The DEA project interface allows the users to upload their artifact in various formats, such as scanned images, photographs, 3D object files produced by 3D scanners, laser and depth scanners. They also have the option to reconstruct the tridimensional shape of objects from images, pursue advanced visualization options, and perform automatic measurements. Each database entry also contains a comprehensive record of the artifact. Therefore, the DEA means to set every advanced technology to the service of the research community.
As for the issue of physicality, the DEA suggests a different apprehension of the term. Environmental conditions and changes in the political landscape are only two reasons that an historical object is weathered, lost, or removed from its original findspot. So 3D models of the artifacts occasionally constitute the only survivor of the original and the sole possibility to join fragments. Therefore, physicality needs to be reconsidered. The DEA project utilizes virtual and augmented reality head-mounted displays, such as Microsoft's hololens glasses. The DEA interface allows the users to browse through 3D databases of artifacts and visualize them within their actual physical space. Once the user positions the hologram of the object, he/she can study it as a whole, up close, and from different perspectives. Similarly multiple artifacts can be positioned next to one another, providing the opportunity for comparative readings and potential identification and pairing of fragments.

147 SMALL THINGS DO MATTER: DETECTING THE MEDIEVAL PERIOD THROUGH ARCHAEOLOGICAL FINDS MADE BY THE PUBLIC

Theme: 6. Interpreting the archaeological record
Author: Lewis, Michael (United Kingdom) - British Museum
Co-Author(s): Deckers, Pieterjan (Belgium) - Virje Universiteit BrusselWillemsen, Annemarieke (Netherlands) - Rijksmuseum van Oudheden
Keywords: medieval, public, material culture, metal-detecting
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

MERC
Medieval Europe Research Community

In the archaeological record, remnants of medieval date (c.400-c.1550) are undoubtedly one of the most abundant categories in the present-day landscape: rare is the ploughed field that does not yield medieval pottery or coins with even a brief surface or metal-detector survey. Due to this accessibility, but also because of the perceived proximity (in time and culturally), of our medieval ancestors, this period often speaks to the imagination of the wider public.

Archaeological small finds are essential for dating and understanding the medieval past, whether these items are found within stratified contexts (considered most useful by archaeologists), or not. Nowadays, across much of Europe, it is common for the public to either proactively search for archaeology, or discover material culture by chance. This session will explore the role of public finds (that is to say those found through metal-detecting, field-walking or by chance) for advancing knowledge of the medieval period.

Papers may explore specific sites, archaeological assemblages and/or the relationship between small finds types and their distribution. These should also highlight the potential of public finds as a resource for archaeological research and public communication, and assess the challenges and opportunities provided by studying material culture found in the archaeological plough-soil or from other disturbed contexts. Particularly welcome will be papers that use public finds data with other sources of archaeological data, as well as historical and art-historical evidence, to provide a more holistic study of the medieval period and understanding of people living at that time.

01 METAL DETECTING IN THE MARSH: THE RECENT DISCOVERY OF THE MIDDLE SAXON SETTLEMENT AT LITTLE CARLTON, LINCOLNSHIRE, UK

Author: Dr. Willmott, Hugh - Department of Archaeology, University of Sheffield (Presenting author)
Keywords: Metal detecting settlement
Presentation Preference: Oral

In 2011 a member of the public started detecting fields in the parish of Little Carlton in Lincolnshire. Adopting a thorough and systematic approach, he recorded the location of individual finds using a handheld GPS, and collected not just precious metals and copper alloy, but also lead and ironwork, as well as surface finds of stone, ceramic and glass. On reporting his finds to the Finds Liaison Officer for the Portable Antiquities Scheme (PAS) in Lincolnshire, the importance of his discovery became immediately apparent; Little Carlton was clearly the site of a hitherto unknown high status Middle Saxon settlement. The detectorist has continued to work systematically ever since, and to date 1,400 small finds with precise location spots have been registered with the PAS.

Since 2015 the University of Sheffield has been working closely in partnership with the PAS and the detectorist by undertaking further archaeological work. This initially took the form of topographic and geophysical survey, and more recently targeted excavation in an attempt to contextualise the finds, and as a result the true nature and significance of the site has only just begun to be understood. This paper will provide an overview of the results so far and argue that the full significance of what has become recognised as a nationally important site has only been possible through the collaboration of the detectorist and the archaeologists. As a result Little Carlton serves and a positive example of how our understanding of medieval settlement can be transformed through active engagements between amateurs and heritage professionals.

02 THE IMPACT OF PUBLIC FINDS ON UNDERSTANDING TRADING AND PRODUCTION SITES IN NORWAY

Author: Associate professor and keeper of the collections of archaeology and cultural history Maixner, Birgit - NTNU University Museum (Presenting author)
Keywords: metal-detecting, public, Norway
Presentation Preference: Oral

Until recently, the Viking Age town of Kaupang was the only trading place archaeologically known from the first millennium A.D. in Norway. However, within the last seven years, private metal-detecting has revolutionised the knowledge of trading and production sites in Norway from the period in question. The aim of the paper is to present two case studies illuminating the impact of public finds and engagement for advanced knowledge about two different kinds of trading and production sites.
The first case study will present a workshop area related to a magnate`s farm at Missingen/Åkeberg, south east Norway. Archaeological excavations had revealed a Late Roman Period farm at the site in 2003-2004, but first a few years later, thanks to amateur archaeologists metal-detecting, the function of the complex could be better understood. In the following, a cooperation project between the districts University museum and private stakeholders was conducted, testing different forms of collaborations in the plough-soil of the surrounding fields. The project resulted in detailed knowledge of the craft activities at the main workshop area and indicated a sophisticated organisation of the surrounding landscape, suggesting both over-ploughed graves and craftsmen's farms.
The second case study will focus on Viking Age trading places at the Trondheim fjord in Central Norway. For years, scholars had speculated of the existence of a trading place in the area without being able to localise it. Thanks to the activity of public metal-detectorists, at least four places with trading activities can now be suggested at the Trondheim fjord, two of them showing striking similarities concerning their strategical position, relation to later medieval farms of special importance and medieval churches. Since none of these places is investigated systematically, they will be taken as example to discuss the information value of single public finds from the plough-soil for advancing knowledge.

03 RECONSTRUCTING THE PAST: THE SIGNIFICANCE OF METAL-DETECTOR FINDS FOR THE INTERPRETATION OF LATE ANTIQUE HILLTOP SETTLEMENTS IN SLOVENIA

Author: Dr. Karo, Špela - Zavod za varstvo kulturne dediščine Slovenije; Narodni muzej Slovenije (Presenting author)
Co-Author: Dr. Knific, Timotej - Narodni muzej Slovenije
Keywords: hilltop settlements, metal-detecting
Presentation Preference: Oral

At the end of the 1980s and especially during the 1990s, there was a marked increase in the activity of unauthorised metal-detector users on Slovenian archaeological sites. Particularly endangered were Late Antique hilltop settlements, hidden in the heights of the once safe mountains and forests. Those metal-detector finds that ended in museum collections revealed different amounts of information about the location and circumstances of their discovery. By employing archaeological methods it was possible to subsequently verify some of these artefacts and confirm the credibility of the acquired data, as well as at least partly reconstruct their archaeological contexts and integrate them with the results of other archaeological investigations.
The presentation gives an overview of four selected archaeological sites: Gradišče above Bašelj, Limberk above Velika Račna, Camberk above Cerov Log and Zidani gaber above Mihovo. In these sites, artefacts lay relatively close to the surface, inside the settlements or in their immediate vicinity, and strong detector signals revealed not only individual objects but also hoards. On the basis of the information provided by the finders, teams of archaeologists verified and documented the stratigraphic situations in the field and thus somewhat preserved the significance of these finds.
In the case of Gradišče above Bašelj, a Late Antique and Early Medieval settlement from which many detector finds originate, these finds were included in the interpretation of the data acquired from excavations conducted in the years 1939, 1998, and 2015, and from LiDAR scanning and geophysical investigations of the site and its surroundings, which have been carried out in the recent years and have confirmed numerous built structures inside the settlement. These new discoveries of architectural remains therefore offer a great opportunity to compare the settlement's structure with the distribution of small metal finds recorded during the previous topographical surveys and through metal-detecting.

04 ACCESS GRANTED: PUBLIC FINDS AND A TRAJECTORY APPROACH TO THE DEMOGRAPHY OF EARLY MEDIEVAL LOCKS AND KEYS

Author: von Ackermann, Megan - University of York (Presenting author)
Keywords: medieval, public, objects,
Presentation Preference: Oral

For early medieval research, locks and keys are particularly information rich objects. Locks demand a high level of resource input in material and craft knowledge. They are also active social agents, affecting the perception of people, spaces, and things. Finally, using ethnographic studies and textual analysis of contemporary texts, there is evidence for a strong symbolic as well as practical significance attached to keys in the early medieval period. These characteristics mean that locks and keys can potentially provide considerable insight into economics, social structure, and beliefs.

However there has been little focused attention given to these objects. One reason is that there are considerable difficulties is traditional object study methodologies both because there is relatively little change in lock technology between the Roman and the later medieval periods, and because the morphology of keys, the objects most often found in archaeological settings, is also fairly stable, making the creation of timelines and typologies problematic.

This paper presents the results of PhD research into the use of data derived from publicly submitted object finds which, because they constitute a significant number of artefacts from a wide geographical area, have potential to provide essential demographic information that can be used to infer continuity of both the technology of lock production and the social conditions that provided the demand for that production.

The study used data drawn from the Portable Antiquity Scheme (PAS), correlated with material from the Museum of London Archaeology (MOLA) to produce a general understanding of the demographics of keys in the Roman and the later medieval period in order to identify persistent lock forms and key morphologies. Artefacts from well dated early medieval sites were then used to establish secure foci around which the more general distribution and population of keys can be inferred.

05 FROM DETECTOR FINDS TO NEW ARCHAEOLOGICAL NARRATIVES – A CASE STUDY FROM EARLY MEDIEVAL COASTAL FLANDERS

Author: Dr Deckers, Pieterjan - Vrije Universiteit Brussel (Presenting author)
Keywords: public_finds, early_middle_ages, coastal_societies
Presentation Preference: Oral

The potential of metal detected artefacts to not just complement existing archaeological knowledge, but transform it and open up new questions, has been amply demonstrated by the Portable Antiquities Scheme in England and Wales. Elsewhere in Europe, however, this potential remains to be realized. This paper will briefly outline the current context of metal detecting in Flanders (Belgium), present new research results on early and high medieval detector finds from the Flemish coastal region, and discuss how public engagement was integral to the study these finds.
Archaeological and historical studies on the early medieval coastal plain have hitherto mainly focussed on chrono-spatial, economic and social aspects of the post-Roman resettlement and further development of the coastal plain. The new metal-detected artefacts contribute significantly to these debates, but also opens up a new 'layer' of cultural and socio-political enquiry. The finds enhance our previously limited knowledge of the social and cultural position of coastal Flanders straddling the Frankish and North Sea worlds, and furthermore allow to assess the dynamics of this position through time in relation to economic, political and other historical developments.
Public engagement was at the heart of this small research project. It emerged from the promotion activities surrounding MEDEA, the new finds recording database for Flanders (www.vondsten.be). Arguably, however, the collaboration with regional museums and archaeological services and the organisation of a small exhibition as a direct, tangible outcome were instrumental factors in getting access to many of these finds. The project thus illustrates the necessity of a motivational 'feedback loop' in engaging with the public as an archaeological researcher.

06 DETECTING EQUESTRIANISM IN THE CENTRAL MIDDLE AGES: NEW PERSPECTIVES FROM METAL-DETECTED FINDS

Author: Mr Webley, Robert - University of York; British Museum (Presenting author)
Keywords: metal-detecting, equestrianism
Presentation Preference: Oral

The advent of systematic recording of metal-detected finds has helped advance the state of small finds research, especially in England and Denmark where such recording is now long standing. Of the biases involved in metal-detected datasets, some can act positively to shed light on aspects of material culture otherwise neglected through tradition-

al excavation. For the long medieval period, one notable object group for which records of metal-detected finds can significantly inform our knowledge comprises non-ferrous equestrian equipment. This represents artefacts often lost in the landscape, captured by hobby metal detectorists in numbers far disproportionate (c. 99%) to those known from excavation (c. 1%).

Indeed, using metal-detected finds, recent analysis of equestrian equipment from the late early-medieval and medieval period (Central Middle Ages) has served to challenge perceptions of the extent of social exclusivity of such accessories, particularly in the 11th century. This paper will use the latest data, from both excavated and metal-detected datasets, to explore such suggestions. Furthermore, it will build on recent initiatives to analyse horse accessories across national boundaries. Such work will only be enhanced in the future by the new recording schemes for metal-detected finds in Denmark (DIME project), Flanders (MEDEA project), and the Netherlands (Portable Antiquities of the Netherlands). However, there is already enough data to suggest that although various items, such as stirrup-strap mounts, were being used throughout a North Sea zone, varieties of both form and decorative treatment were together being used in distinct areas to create and reinforce local identities.

Due to the likelihood of recovering non-ferrous equestrian equipment through hobby metal-detecting, much knowledge and interest resides within the metal-detecting communities of North West Europe. It is hoped that such interest would be engaged by such work as set out in this paper, thereby encouraging finders to share finds through detailed recording.

07 DETECTING AND ARCHAEOLOGICAL FINDS AS A SOURCE TO THE USE OF SYMBOLS AND FASHION IN 11TH CENTURY DENMARK

Author: Archaeologist Søvsø, Mette - Sydvestjyske Museer (Presenting author)
Keywords: Jewellery, dress, symbolism
Presentation Preference: Oral

Like other types of metaldetecting finds, the number of medieval dress accessories and jewellery have increased in Denmark as a result of the Danish "danefæ" law and the growing number of detectorists during the last decades. It is clear that most of the types have a much wider geographical spread than earlier assumed. The objects also occur in many different qualities which indicates a relatively wide social spread. Among these common types are some 11th and 12th century brooches with Scandinavian style elements mixed with Christian symbolism. Other sources are sparse when it comes to the use of jewellery and symbols in relation to dress and fashion in Scandinavia at that time, and the metaldetecting finds are therefore an important source to the subject. An excavation next to the Cathedral in Ribe, Denmark, a few years ago revealed the remains of a bronze casters workshop from around 1100. The excavated finds includes a great number of waste from the casting processes, among other things thousands of clay mould fragments. They show us that the workshops repertoire included several of the 11th and 12th century brooch types and that they were massproduced in a relatively modest quality. The find has not yet been fully analyzed, but it could be an important key to understand both techniques, spread, use and meaning of the objects.

08 DANISH SCABBARD CHAPE'S OF SHEET-METAL FROM 11-12TH CENTURY

Author: Mr. Feveile, Claus - Sydvestjyske Museer (Presenting author)
Keywords: scabbardchape, metaldetector
Presentation Preference: Oral

Until recently, the Danish finds of scabbard chapes of sheet metal, bend in U-form, has been regarded as imported finds from the regions south of the Baltic Sea. This paper will present an analysis of more than 300 finds from Denmark, largely made up by metal detector finds during the last decades. It is being concluded, that most of the finds can be divided into regional varieties, made locally and that only some varieties derive from the Slavonic areas.
It will be discussed, weather the distribution is affected by knowledge or ignorance of this findgroup within the metal detector communities and/or the local museums in Denmark, and some proposals how to deal with this problem will be made.

09 LATE-MEDIEVAL BLING: THE MEANING OF METAL MOUNTS ON BELTS AND BAGS

Author: Dr Willemsen, Annemarieke - National Museum of Antiquities, Leiden (NL) (Presenting author)
Keywords: Mounts, metal-detecting, fashion
Presentation Preference: Oral

Small metal mounts, in copper sheet or pewter, are often found by the public. They are well-known for their diversity in shape and way of attachment. Sometimes they are still fitted onto straps or odd-shaped pieces of leather. Research into thousands of these metal-detected mounts from the Netherlands and Flanders, placed in a European context, has shown that they date mainly from the Later Middle Ages, were constructive and decorative at the same time, and include many objects and letters, referring to for instance religion, heraldry, leisure, and love. Belts, purses and shoes with shiny gold- and silver-coloured decoration were a fixed part of Late-Medieval fashion, not only for men, women, and children, but also for their pets. The mounts have been found in both towns and small villages, which indicates whose fashion we are talking about, and what kind of people obviously, through their accessories, conveyed subtle messages about Late-Medieval thinking, culture, and identities.

10 CASE OF FITTINGS FINDS OF SO-CALLED 'LITHUANIAN PURSES' FROM MODERN POLAND.

Author: Dr Sawicki, Jakub - AU - Institute of Archaeology of the Academy of Sciences of the Czech Republic (Presenting author)
Co-Author: Dr Karpiński, Paweł - Department of Genetics, Wroclaw Medical University, ul. Marcinkowskiego 1, 50-368 Wrocław
Keywords: small finds, Poland
Presentation Preference: Oral

In Polish professional archaeological literature there are currently 5 items published, which originally were decorative elements or clasps of so-called lithuanian purses. It is a distinctive type of a bag, which is not to be easily confused with the other types of a dress accessories. These items have been identified by archaeologists in Lithuania and are found on different archaeological sites, mostly in modern Ukraine, Russia, Lithuania, Latvia and Belarus. The chronology of those artifacts range from 15th to 17th century.

The subject of our presentation is a research over those items, which has been conducted over the last 10 years using data from specialized internet forums of so-called metal detectorists – a data provided by the public. Also it should be noted, that great part of this study is a result of work of dr. Paweł Karpiński – a scholar who is professionally

dealing with completely different field of science and as such, in terms of this session, is also a public person. Few years ago we have established a cooperation which has resulted in this case study.
On this basis, among others, we now know that from the area of modern Poland there is over 2000 elements of lithuanian purses. It should also be noted that the use of metal detectors to search artifacts in the ground by private people, is in Poland forbidden by law.
We would like to present this interesting category of artifacts. At the same time we would like to discuss some issues concerning study of small finds discovered without the stratified archaeological context and possible methodological approach to existing large databases of finds unknown to most professional archaeologists.

11 SMALL METAL FINDS IN PAN (PORTABLE ANTIQUITIES OF THE NETHERLANDS)

Author: Dr Kars, Mirjam - VU Amsterdam (Presenting author)
Keywords: medieval reference types
Presentation Preference: Oral

The Portable Antiquities of the Netherlands (PAN) scheme enables the registration of small (but also fairly large) metal finds which are present, often already for decades, in private collections of Dutch metal detector searchers. These finds will be made public not only by means of photographs and descriptions, but also by means of a type reference system covering the period from Prehistory to the Middle Ages. This type reference system will be created on the basis of the finds registered during the PAN-project term of four years. The specific combination of records with detailed information, among which the find locations, on individual objects and their related reference types provides a dataset with data mining possibilities that can serve interests of both a wider public and the scientific community.
The registration of finds according to the PAN standards started in the second half of 2016. The database is growing ever since and now comprises thousands of finds from all over the Netherlands. The type reference system is still under construction. For the most frequently registered medieval finds, the Carolingian brooches and the late medieval buckles and buttons, the type reference frameworks are already developed.
In this paper the methodological issues concerned with establishing a diachronic type reference system will be shortly discussed and exemplified with the medieval buckle features that were defined for the purpose of developing this system. Some specific overviews of buckles registered in PAN, created on the basis of their reoccurring features through either time or space, will be presented in order to show how such overviews can be both informative for a wider public and contribute to scientific research.

12 'ANOTHER MAN'S TREASURE': HIGHLIGHTING THE IMPORTANCE OF SMALL MEDIEVAL FINDS TO RESEARCH AND MUSEUM COLLECTIONS IN SCOTLAND.

Author: Dr. Ferguson, Natasha - National Museums Scotland (Presenting author)
Co-Author: Miss McGill, Lyndsay - National Museums Scotland
Keywords: elite, collection, battlefield
Presentation Preference: Oral

In Scotland the flexibility of what can be considered 'treasure' has allowed for diverse assemblages reflecting a broad spectrum of medieval material culture to be physically allocated to museum collections for research and public display. National Museums Scotland (NMS), with the exception of key excavation assemblages, consider chance finds reported by the public through the Treasure Trove Unit (TTU) to represent a consistent and reliable source of medieval material culture in which to build collections.
As the volume of medieval artefacts recovered through hobbyist metal detecting has significantly increased in recent years so too has the scope of research. This is particularly evident in the visibility of concentrated distributions of material relating to secular elites and their close association with castle sites and ecclesiastical centres. While this association may not be unexpected, in Scotland such assemblages, including heraldic harness pendants, sword pommels, seal matrices, coin hoards and gilded dress accessories provide an important corpus of material in which to recognise the presence of previously unknown elite medieval landscapes not represented in excavation. For example, this corpus had contributed significantly in highlighting alternative perspectives towards the survival and recognition of medieval battlefield assemblages; assumed to be predominately characterised by fragile iron objects and therefore invisible in the archaeological record.
Using selected case studies across Scotland and drawing from recent collections within NMS and research from (TTU), this paper will discuss the significant contribution, while highlighting the potential caveats, of artefact discoveries by the public as a key resource in medieval research.

149 ARCHAEOLOGY OF EUROPEAN "GUERRILLAS": RESISTANCES, LANDSCAPES AND MEMORIES

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Ayán Vila, Xurxo (Spain) - University of the Basque Country
Co-Author(s): Gomes Coelho, Rui (United States) - Binghamton University
Keywords: Conflict Archaeology, guerrile, Battlefield Archaeology
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

In recent years Archaeology of the Contemporary Past has focused on the study of ruins (internment camps, monuments and battlefields) and the politics of memory generated along the XXth century by the different totalitarian States. Our session aims to address those other landscapes and more modest, sometimes forgotten, materialities linked to the different movements of resistance against fascism and communism in our continent. From a comparative, transnational perspective, we want to provide a novel insight into the "guerrilla" phenomenon in recent European history.

01 MEMORY AND THE MATERIAL CULTURE OF RESISTANCE: THE MATERIALITY OF INDEPENDENCE IN EARLY 20TH CENTURY FINLAND

Author: Dr. Ylimaunu, Timo - University of Oulu (Presenting author)
Co-Author: Prof. R. Mullins, Paul - Indiana University-Purdue University Indianapolis, Indiana, USA; MA Koponen, Tuuli - University of Oulu
Keywords: Finland, resistance, 1900-century
Presentation Preference: Oral

Our paper will consider the development of a material culture of resistance and nationalism in Northern Finland in the early 20th century. Finland's status as an autonomous Grand Duchy of Russia came into dispute in 1899 when the Tsar's "February Manifesto" asserted the Russian empire's rights to govern Finland. This started the so-called period

of Russification in Finland. One part of the Finnish population turned towards active and armed resistance against the Russian authorities in Finland in the early 20th century, and eventually Finland secured its independence in 1917. We will discuss what role material culture had in the resistance towards Russian in Finland and how that resistance has been memorialized. We will use the stamps and smuggled arms as examples of the passive and the active resistance. We will discuss how the resistance and the Jaeger movement, the Imperial Germany trained Finnish independence soldiers, have been memorialized.

02 BRICKS AND BULLET HOLES: REMEMBERING AND FORGETTING THE 1916 EASTER RISING IN DUBLIN

Author: Ms Campbell, Eve - Archaeology and Built Heritage; The Archaeology of 1916 Project (Presenting author)
Keywords: contemporary, battlefield, urban
Presentation Preference: Oral

The Easter Rising, fought over a single week in April 1916 at several locations throughout the centre of Dublin city, was a key moment in the history of the Republic of Ireland, and indeed the British Empire. The Rising, an armed insurrection of just over 2,500 rebels, aimed at establishing an independent republic in Ireland. It was swiftly put down by the British military, and its leaders were executed. The fighting was fierce and bloody with the city's principal thoroughfare being reduced to a smoking ruin. Memorialisation of the Rising began almost as soon as it was over. In the weeks after the Rising its locales became the focus of battlefield tourism and public curiosity. The city's gutted edifices and redundant street barricades were photographed and commemorative postcards were rapidly produced. In the 100 years since the Rising, it has become part of the foundation myth of the Irish state.

Despite the significance of the Rising, its physical battlefield landscapes have been largely disregarded. It was only in 2016, after a conflict around proposed redevelopment of the area, that Moore Street, the most legible of the sites, was designated a National Monument. The Archaeology of 1916, a collaborative project between Dublin City Council, UCD, and Archaeology and Built Heritage, was formed to address this lacuna. Through fieldwork carried out during spring 2016, the project has sought to investigate the archaeology of the Rising's battlefields. The mapping of these archaeological remains, materialised in destruction, damage and repair to Dublin's urban fabric, has both added to the narrative of the Rising, and provided a more considered account of the conflict and its aftermath in the contemporary urban environment. The public component of the project has added to debates around the legacy and future of these landscapes.

03 'DOUBLE VISION' AND THE LANDSCAPE OF RESISTANCE IN THE CHANNEL ISLANDS

Author: Dr Carr, Gillian - University of Cambridge (Presenting author)
Keywords: Landscape, heritage, double-vision
Presentation Preference: Oral

The heritage of the German occupation is the most predominant form of heritage in the landscape of the British Channel Islands today. For the first fifty years this focused on restored bunkers and occupation museums, representing the materiality of the perpetrators; but the voices of victims of Nazism (especially former political prisoners, imprisoned for acts of resistance) was marginal. Although a small number of memorials in marginal places have been added to the landscape of occupation since 1995, only since 2015 has a visible heritage of resistance began in earnest through the activism of the author. For 70 years, the landscape of resistance has resided only in the mind's eye of those originally involved. For this group, the skill of 'double vision' has been cultivated: able to see at once the landscape as it is now and as it was then. While this skill came naturally to the first generation, the second generation relied on visual prompts in the form of material traces still extant in the landscape while they were growing up. For the third generation, these traces are insufficient for the continuation of the skill of double vision and resistance memory. Instead, photographs, video, and imagination have been heavily relied upon. Coupled with new technology and the aid of the first and second generation, a series of online videos were recently commissioned by Jersey Heritage as part of a Resistance Heritage Trail designed by the author. This paper, then, discusses the role of double vision in the handing down of resistance heritage, in education, and in the creation of modern landscapes of resistance.

04 WAR REMAINS IN NORDDALEN: A (GREAT) MARGINAL RESISTANCE TO THE GRAND NARRATIVE

Author: Figenschau, Ingar - UiT – Arctic University of Norway (Presenting author)
Keywords: WWII, Norway, resistance
Presentation Preference: Oral

WWII is a well-known topic, also increasingly within archeology. Through documentaries, literature and biographies we have become familiar with WWII history and central events. Major military strategic operations like Market Garden and the Battle of Stalingrad are close to "common knowledge". So are also the heinous images from the prison camps of Birkenau and Auschwitz. All these are part of a canonized war history focusing on the major events in central Europe and the former Soviet Union. These accounts have somewhat become the very definition of WWII and the expected trajectories of its grand narrative – a generalized picture of the WWII, its course and its infrastructure.
In the Lyngen fjord, northern Norway, lie the remains of the third Reich's last defenses against the Red Army, the Lyngen Festung. Behind the fortifications we find four POW camps bearing names of Austrian alpine cities: Spittal, Mallnitz, Gastein and Kitzbühel. These somewhat inept place names are one of the few things that connect this marginal and more or less anonymous place, and the events it memorizes, to the grand war narrative. Although the war, the soldiers and the prisoners fought their battle for the Third Reich, the Red Army or their freedom, they have received little foothold in the canonical war remembrance on neither a national nor international level. In Europe's peripheries and fringelands there are still today marginalized war remains that through their infrastructure and location provide a resistance to the grand war narrative, and the established images of war structures and landscapes. In addition, their stubborn persistence in these landscapes can be said to manifest a tangible opposition to the war as something completed and passed. Maybe these remains of war have an important voice for the marginalized

05 "LAST MORNING": MATERIAL AND IMMATERIAL MEMORIES OF SOVIET PARTISAN RAIDS AGAINST FINNISH CIVILIANS IN LAPLAND IN THE SECOND WORLD WAR

Author: Mr Seitsonen, Oula - University of Helsinki (Presenting author)
Co-Author: Dr Herva, Vesa-Pekka - University of Oulu
Keywords: WW2, partisan, Finland
Presentation Preference: Oral

Finnish and Nazi German troops invaded together Soviet Union in the Second World War, as part of Hitler's Operation Barbarossa. Arctic front in Lapland was mostly on the German responsibility, but the German troops, unfamiliar with the northern environment and overcome by its poor infrastructure, made little advance and there was very little actual fighting in 1941–1944. Owing to the demanding environmental setting, there were no continuous frontlines, but defense relied on isolated outposts with vast stretches of wilderness between them. This enabled both sides to infiltrate guerilla troops behind the enemy frontlines: Finns sent out so-called long-range recon patrols for scouting and sabotage deep in the Russian soil, whereas the Soviet partisan troops moved through the wilderness to carry out reconnaissance and terror attacks on isolated Finnish homesteads and solitary vehicles. Soviet partisans murdered in these attacks nearly 200 women, children and elderly people in the remote villages deep behind the frontlines. Finns and Germans formed anti-partisan troops to answer these attacks, and also armed the civilians to protect the distant homesteads, but this was not enough to prevent them totally. In the postwar decades, the Partisan attacks and their memory and material traces were ignored, effectively until the fall of Soviet Union, to the dismay of the survivals and the relatives of the civilian casualties. It took until late 1990s before they got any national recognition or compensation. There has still been very little historical or other research on the subject, and the locals feel their heritage has been overlooked and sidelined. In this paper, we map the range of perceptions on and engagements with the material remains of the Soviet partisan attacks.

06 THE INVISIBLE MATERIALITIES OF THE ITALIAN RESISTANCE MOVEMENT DURING WORLD WAR 2

Author: Dr De Nardi, Sarah - Durham University (Presenting author)
Keywords: materiality, wW2, resistance
Presentation Preference: Oral

In the Italian civil war of 1943-1945, the sides in the conflict were deeply uneven. Their poetics was fundamentally, ontologically different. On the side of the Fascists and the Germans, we are dealing with traditional army strategies and fighting tactics. The resistance fought a downright guerrilla warfare. The Germans and Fascists had formal headquarters, barracks and physical, emplaced strongholds; the Resistance had none of those things – the Resistance was transient, placeless, and invisible. They had to be, because buildings and base camps were potential death traps. Due to the very nature of the organization and strategy of the resistance, material culture in the strict sense is scarce. The partisans had to leave no traces of their passage, lest the local population be punished or suspected of collusion with the 'rebels.' The partisans had to learn to disguise their presence wherever they went. That is why when we think about the materiality of the resistance, we tend to engage with the absence of things, bodies and places, rather than a presence. And yet, doing a sensory ethnography of the resistance movement entails encountering and engaging with conflict experience through remembered things, loved things and mourned things. Besides conceptualising stories and places of conflict as part and parcel of a complex wartime materiality, this paper also considers physical remnants of the resistance struggle – for instance, sketches, letters and photographs of desolate ruined villages as co-constituting identity, emotion and memory with the storytellers.

07 ANTI-SOVIET PARTISAN WARFARE IN LITHUANIA IN 1944 – 1965. HISTORY, ARCHAEOLOGY, AND HERITAGE PROTECTION.

Author: Dr. Velius, Gintautas - Vilnius University (Presenting author)
Keywords: Anti-Soviet, Partisan, Warfare
Presentation Preference: Oral

When in 1944 the Soviet Union reoccupied Lithuania tens of thousands Lithuanian patriots joined the armed resistance. These military units operated following a set of statutes and instructions. Partisans were dressed in military uniforms of Republic of Lithuania and must pledge allegiance. The gathering of all anti-Soviet partisan leaders in February of 1949 established a headquarters of military and political resistance. It also declared these headquarters to be the only legitimate government until partisans achieve their goal – restore an independent Lithuania.

The organised resistance lasted for a decade. At least 50.000 soldiers enlisted. Over 20.000 did not survive. Historical documents reveal that around 30.000 partisans were active in spring of 1945. Units mostly consisted of civilians commanded by former officers seeking to restore the independence. Organised resistance ceased in 1953 while some militants continued fighting until 1965.

After Lithuania regained independence the significance of sites related to the anti-Soviet partisan resistance was acknowledged. Between 1990 and 2015 over 400 locations received legal protection and status of cultural heritage sites. They constitute 2,4% of all cultural heritage sites in Lithuania. Most of them are locations of either death or burial of partisans. The main sources for academic study of the partisan warfare in Lithuania are the remaining KGB documents (kept in Office of the Chief Archivist of Lithuania), testimonies of survivors, surviving documents of partisans, and memoirs. However, they rarely present the full picture. Therefore, 2010 were marked by an emergence of archaeological studies of sites related to the armed resistance. Since then various types of sites like bunkers (usually the death place of resistance fighter) and battlefields are being excavated. In addition, the attempts to locate unfamiliar burial places of partisans are constantly being made.

08 DOCUMENTATION OF THE SOVIET GULAG CAMPS IN SOUTH EASTERN SIBERIA AND MULTIMEDIA APPROACHES IN PRESENTATION OF THE GULAG HISTORY

Author: Mgr., Ph.D. Holata, Lukáš - Department of Archaeology, University of Exeter
Co-Author: Bc. Světlík, Radek - Gulag.cz, z.s. (Presenting author); Černoušek, Štěpán - Gulag.cz, z.s.
Keywords: Gulag, virtual museum
Presentation Preference: Oral

This paper presents the results of the expedition for documentation of abandoned Gulag camps in Kodar mountains (South Eastern Siberia). It focuses on obstacles and problems that occur in Gulag camps research, and methodological approaches used in documentation of Gulag camps in extremely remote locations such as taking spherical panoramas or close-range photogrammetry used for recording of standing buildings and other areas within the camp as well as artifacts preserved in-situ. The paper also aims to present

multimedia approaches which have been applied within the Gulag Online virtual museum where the results of our documentation team are implemented. The virtual museum presents the basic form and dimensions of Soviet repression. It is built around a complete 3D tour of a Gulag camp and current panoramic photographs illustrated by the testimonies of survivors or literary excerpts. Also a 3D tour of authentic objects and documents is included, as well as an interactive map containing satellite images and archival military maps that illustrates the geographic extent of Soviet repression.

09 'HÉROES CONTRA A SÚA PROPIA VONTADE', AN ARCHAEOLOGY OF THE SPANISH GUERRILLA SETTLEMENTS IN NORTHWESTERN IBERIA.

Author: Dr. Tejerizo-García, Carlos - Institute of Heritage Sciences (Incipit, CSIC)
Co-Author: Dr. Ayán-Vila, Xurxo - University of the Basque Country (Presenting author)
Keywords: Spain, Galicia, myth
Presentation Preference: Oral

The end of the Spanish Civil War was followed by a period of strong repression but also by the continuation of resistance through other means, being the guerrilla one of the most important. As Hartmut Heines states, this strong repression of the new regime forced the dispersed and isolated groups of fugitives (fuxidos) to become a truly guerrilla. This process supposed a change of the tactics with significant implications in materiality which included the construction of permanent camps and a transformation of landscapes to create new forms of resistance. Consequently, it implied a new concept of the guerrilla identity, more organized and even more politicised at least in the imaginary, which will finally lead to the generation of the myth of the guerrillero. One of the most important of these settlements was the so-called 'city of the jungle' (a cidade da selva), an ensemble of little camps the guerrilla established in the early 40s in the Bruña valley and the Casaio mountains in the southwestern part of current Galicia. Although well known from oral interviews and documentary sources, this important site has never been object of an archaeological study in order to understand the development of the Spanish guerrilla in northwestern Iberia after the end of the Civil War. This paper will present the initial steps of a project on the 'city of the jungle' and the potentiality of an archaeological and anthropological approach to a polemic and even distorted phenomenon in current Spain.

10 THE WAR OF CAMBEDO, 1946. AN ARCHAEOLOGY OF RESISTANCE IN THE PORTUGUESE-SPANISH BORDER

Author: Mr Gomes Coelho, Rui - Cultural Heritage and Preservation Studies, Rutgers University, USA (Presenting author)
Keywords: Contemporary Archaeology, Memory
Presentation Preference: Oral

After the Spanish Civil War (1936-1939), a group of anti-Francoist guerrillas took shelter in the Portuguese village of Cambedo, in the border between Trás-os-Montes and Galicia. The villagers actively supported them to the last consequences. When the Portuguese and Spanish dictatorships sent the military to hunt down the insurgents in 1946, the villagers of Cambedo paid the heaviest toll: they were persecuted, sent to jail, and stigmatized for several decades. Anthropologist Paula Godinho revisited the events in a long-term fieldwork project in the late 1980s, and her work brought the war of Cambedo back to the public sphere. In this paper, I will examine the events of 1946, and contextualize them in the larger process of rural resistance to state formation, and border enforcement in Portugal and Spain. I will focus on a house that was damaged and abandoned during the assault to the village, and discuss its relevance regarding contemporary issues of social justice. I argue that the Portuguese-Spanish borderland is an assemblage in which violence, hope, and the work of memory are materialized by the multi-temporal encounter of guerrillas, peasants, anthropologists, and political activists.

11 ARCHAEOLOGY OF THE REPIL BATTLE: RECOVERING AN ABSENT LANDSCAPE.

Author: Dr Vila, Xurxo - University of the Basque Country (Presenting author)
Keywords: Galicia, guerrilla, Francoism
Presentation Preference: Oral

On April 20 1949, the 'Santiago Carrillo' dettachment of the 2nd Group of the Galician Guerrilla Army was besieged by the Civil Guard in two houses of the Chavaga parish (Monforte de Lemos, Lugo, Galicia, Spain). This was the beginning of the end for the guerrilla in this part of Galicia. Through archaeology, we try to recover the absent landscape of the anti-Francoist guerrilla and study the present landscape, established by Francoism in the countryside. This is the landscape in which the local community was socialized in the immediate postwar period. Our research inteds, on the one hand, to overcome the silence imposed by the trauma of the repression, and, on the other hand, to recover forgotten spaces as true places of collective memory.

12 MOLUCCAN RESISTANCE IN THE NETHERLANDS: ARCHAEOLOGY OF GUERRILLA, PROTEST OR TERRORISM?

Author: MSc Wijnen, Jobbe - Wijnen Cultuurhistorisch Onderzoek (Presenting author)
Keywords: contemporary conflict archaeology
Presentation Preference: Oral

What is the role of conflict archaeologists in recent and partally unclosed conflicts? This paper discusses the proceedings of the 'Moluccan Heritage Project'.

As a result of the decolonization of the (former) Dutch East Indies, the independence of the Republic of Indonesia in 1949 and the proclamation of an independent Moluccan state in 1950, a large community of Moluccan soldiers serving in the Royal Netherlands East Indies Army became the plaything the complex political situation. As a result the Dutch government shipped 13.000 Moluccans, mainly military personnel and their families, to the Dutch mainland in Europe where they were demilitarized and housed in former Nazi Germany concentration camps. They were promised that they would be allowed to return to the Moluccan Islands shortly. However, this promise would be broken: The return never happened. As a result the Moluccan people's relationship to the Dutch state deteriorated vastly over three decades. A deep conflict developed, escalating the 1970ties in second generation violent outbreaks, train and school hijackings and killings, and in violent armed countermeasures by the Dutch state.

Today the landscape of Moluccan struggle for recognition is partly forgotten, still unrecognized as (possible) cultural heritage, and prone to unseen disappearance. In line with the international developments of contemporary archaeology, the 'Moluccan Heritage Project' reflects on the role of Dutch archaeologists - who are rarely if ever of Moluccan origin - in this process. Should these 'battlefields' be regarded as heritage in need of protection? Are they the remains of either courageous struggle against failing and degrading

Dutch policy, or the remains of plain terrorism? And what do the Moluccan communities think themselves? This paper discusses the proceedings of this ongoing experiment in Dutch archaeology.

More information (in Dutch): https://molukserfgoed.com/

13 ARCHAEOLOGY OF GREEK CIVIL WAR. THE CASE OF THE CAVES OF WESTERN MACEDONIA

Author: Mr Kontos, Michalis - Greek Ministry of Culture
Co-Author: Mrs Karadimou, Agni - Greek Ministry of Culture (Presenting author)
Keywords: Civil War, Caves
Presentation Preference: Oral

The Greek Civil War started after the end of the Second World War, in the year 1946. The two armies that fought were, for the Right, National Army, the army of the official government, supported by UK at the beginning and USA later, and, for the Left, the Democratic Army of Greece (DSE), the military branch of the Greek Communist Party, assisted by the neighboring communist countries of Albania, Bulgaria and Yugoslavia. The civil war ended in 1949 with the defeat of DSE. Violent battles were fought all over the country, mainly on the mountains where the guerillas had resorted.
During all that period, caves were used, principally by the guerillas, as shelters, arms depots, places for the provisional care of the wounded, or even as well organized hospitals. Their use is linked to historical facts and persons, while it is often correlated across the landscape with existing settlements and still visible constructions serving as landmarks of this troubled period.
Main goal of our research is the preservation of the historical memory via an archaeological approach of the material remains detected inside the caves, in an environment that is gradually stripped of the residues.
The research project focuses initially on the caves of Western Macedonia, in the Prefectures of Kastoria and Florina, and especially on the mountains of Grammos and Vitsi and on the plateau of Prespes, areas that were the main scenes for the crucial battles of the civil war, especially during its last phase, from 1948 to 1949.
Our research includes:

- Field Research.
- Searching in the records/files of the Ephorate of Palaeoanthropology-Speleology.
- Study of the historical records and archives.
- Oral interviews.

14 WELCOME TO THE JUNGLE? GUERRILLA IMAGINARIES AND LANDSCAPE FICTIONS IN BASQUE CONFLICT'S SELF-REPRESENTATIONS

Author: Santamarina-Otaola, Josu - University of the Basque Country (UPV-EHU) (Presenting author)
Keywords: Basque Conflict Guerrilla
Presentation Preference: Oral

Basque Country has lived a complex and multi-faceted political conflict in (at least) last eight decades. In 2011, one of the main agents in the struggle, the pro-independence socialist armed group called ETA, announced the end of its violent activity. Now, the base of the conflict seems to be the fight for the victory in the memory battlefield. In respond to this new scene, Archaeology can be a useful tool just to explore different connections between violence itself –in material terms– and its representations materialized as symbols, performative rituals and collective imaginaries.

The aim of this communication is to carry out a survey on the "guerrilla face" of the conflict. Firstly, we are going to analyze how the main "guerrilla scenery", the mountains and the non-civilized Basque landscape, became the ritual and political space of the first clandestine movements against Franco's Dictatorship in the 1960's. In a well-industrialized and urban society as Basque society was, the conceptualization of this "wild" and "free" space seems to respond to an ideological construction more even than a functional choice in terms of armed fight. Secondly, the "guerrilla" inspiration of ETA, based on Liberation Movements from decolonization processes became a real nightmare for security forces of the Francoist State: policemen and Guardia Civil –the militarized rural Spanish security force– built an "anti-guerrilla" conscience and developed concepts like the "Northern Syndrome" to explain their fight against ETA making use of Vietnam's War imaginary.

We are going to develop our analysis centered on three main dimensions: discourses –materialized in documents, speeches, posters and audiovisual contents–, artifacts and objects, and, finally, landscapes –made by material and immaterial built spaces.

150 ISLAND NETWORKS: ANALYTICAL AND CONCEPTUAL ADVANCES IN THE ARCHAEOLOGICAL STUDY OF INTRA- AND INTER-ISLAND RELATIONSHIPS

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Laffoon, Jason (Netherlands) - Leiden University; Free University Amsterdam
Co-Author(s): Borck, Lewis (United States) - Archaeology Southwest; University of Arizona
Keywords: Networks, Islands, Relationships, Interaction, Exchange
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Many island settings throughout the world represent archaeologically understudied spaces with turbulent histories. These regions often offer complex interconnections of settler and indigenous dynamics further complicated by restricted terrestrial environments. These colonial/indigenous relationships are also frequently built on existing inter-community indigenous relationships that can be difficult to uncover. Archaeologists have used a wide variety of analytical and conceptual tools to understand and highlight the existence of these pre- and post-colonial interactions, and to explore how these relationships were built, maintained, modified, and abandoned. These include network analysis (both quantitative and conceptual), châine opératoire, consumption frameworks, artifact biographies, communities of practice and enculturative learning paradigms, and actor network theory. While surficially different, these forms have underlying similarities in that they all focus to varying levels on relational qualities found in various forms of data, including between individuals, archaeological settlements, groups, material culture, and steps in the production process. Relational analyses like these allow researchers to build bridges between multiple temporal periods and between the islands (and often the mainland). In this session, to represent the truly heterogeneous nature of data and relational meth-

odology, presenters will use a varying mix of historical documents, oral traditions, and a multitude of analytical techniques applied to the material record to examine historical inter- and intra-community social relationships present within and between islands.

01 ISLAND NETWORKS: TRANSFORMATIONS OF INTER-COMMUNITY SOCIAL RELATIONSHIPS IN THE LESSER ANTILLES ACROSS THE HISTORICAL DIVIDE

Author: Professor Dr Hofman, Corinne - Leiden University (Presenting author)
Co-Author: Dr Laffoon, Jason - Leiden University; Dr Borck, Lewis - University of Arizona; Dr Scott, Rebecca - Leiden University; Breukel, Tom - Leiden University; Slayton, Emma - Leiden University; Dr Hoogland, Menno - Leiden University
Keywords: Indigenous, Caribbean, Networks
Presentation Preference: Oral

The Caribbean Sea functioned as a hub for human mobility and the exchange of goods and ideas during the whole of its pre-colonial history from 7500 years ago onwards. AD 1000-1800 represents an archaeologically understudied period, during which the Lesser Antilles came under increasing influence from the Greater Antilles and coastal South America and participated in the last phase of indigenous resistance to colonial powers. This paper summarizes the results of the NWO-Island network project in which a multi-disciplinary set of archaeological, archaeometrical, geochemical, GIS, and network science methods and techniques have been employed to disentangle this turbulent era in regional and global history. Canoe route-modelling and least-cost pathway analysis were used to evaluate connections between island sites, looking for signs of seasonal and social patterns exposed by the resulting routes. Isotopic bioarchaeological approaches were applied to human and animal remains from the Lesser Antilles to investigate geographical and temporal patterning of dietary and subsistence practices throughout the archipelago, and to explore complex networks of interaction manifested through the distribution of non-native animals and artefacts manufactured from faunal materials. Portable X-ray Fluorescence Spectrometry (pXRF) was used to characterise the chemical composition of ceramic objects with the aim of provenancing the material, and highlighting the nature of potential interactions between islands groups, i.e. whether objects, or people and ideas were moving. Wear trace analysis was used to investigate macro-lithic artefact biographies, seeking to assess network itineraries based upon their manufacturing strategies and patterns of use. These diverse approaches are linked by the relational approaches they use to explore and uncover how communities are created and changed through teaching, trade, migration, movement, and exchange.

02 INDIGENOUS MOVEMENTS AND SOCIAL TRANSFORMATIONS IN THE LESSER ANTILLES (POST-1492)

Author: Dr. Mans, Jimmy - Leiden University (Presenting author)
Co-Author: Dr. Borck, Lewis - Leiden University
Keywords: Movements, Transformation, Caribbean
Presentation Preference: Oral

This research is a contribution to on-going investigations into the indigenous-historical archaeologies of the Lesser Antilles at Leiden University. In the recent past, several scholars have mentioned the heterogeneous character of the group that collectively came to be known as 'Carib' in historical sources on the Lesser Antilles. Throughout the colonial period (1493-c.1800), the social fabric of the different 'Carib' communities changed tremendously through processes of Indigenous-European interactions, indigenous movements, and the absorption of European colonists and enslaved Africans. The mentions of Carib attacks (retaliate in most cases) and movements in the historical sources (Spanish, English, French, Dutch) provide fragmented but rich data to empirically start disentangling and reproaching the collective categories of both 'Carib' and 'Kalinago' and to advance our understanding of how such activities contributed to the transformation of indigenous identities. The paper will examine the dialectic between indigenous movements and social transformations using the empirical data mined from historical sources. It will help further the theoretical discussion on the transformations of the indigenous assemblages in ever smaller spaces and the need for social power in balancing cultural relationships.

03 NETWORKS ENGRAVED ON BONE: DECORATED ARTEFACTS AND SOCIAL RELATIONSHIPS WITHIN/ BETWEEN THE ARCHIPELAGO OF TIERRA DEL FUEGO AND CONTINENTAL PATAGONIA

Author: Dr Fiore, Danae - CONICET (Presenting author)
Keywords: Fueguian decorated artefacts
Presentation Preference: Oral

Hunter-gatherer-fisher populations have decorated bone artefacts in Tierra del Fuego and southern Patagonia along a large period of time (6400-100 years BP). In spite of the potential biogeographical barrier generated by the Magellan strait, which divides continental Patagonia from Tierra del Fuego, regional comparative analyses of more than 300 decorated artefacts found in the Fueguian archipelago -Beagle Channel, Northern Isla Grande, Otway sound- and in Patagonia -Brunswick Peninsula and Southeast Patagonia- show the existence of inter-regional trends in the production of decorated artefacts. Such trends are particularly evidenced by harpoon points and beads decoration, which had differential patterns and temporal trajectories according to each artefact type: harpoons had greater design variability, thus suggesting a greater individual input in their decoration and were mostly decorated in the 6400-4300 period in several regions, thus suggesting linked processes in the production and discontinuation of this tradition; beads had greater standardization, thus suggesting a greater potential social control of their decoration, probably partly due to their functions as social markers and were decorated along the whole archaeological sequence, thus suggesting that such social functions were effectively reproduced through time by the producers and wearers of these ornamental items. Visual and technical analyses, and interpretations of some of these decorative designs are offered in this presentation. It is suggested that these different trends, which operated within the Fueguian archipelago and also across the Magellan strait, linking Tierra del Fuego with Patagonia, show the existence of inter-regional social relationships which were sustained by groups with aquatic mobility technologies. Thus, the paper contributes to the notion that the Indigenous production and use of canoes, which has been documented in Tierra del Fuego by written historical-ethnographic sources from the 17th. century onwards, and by photographic records from the 19th. century onwards, probably has prehistoric roots.

04 LEAST COST ANALYSIS OF EARLY MOVEMENT EVENTS THROUGH THE DUNDAS ISLANDS, BRITISH COLUMBIA

Author: Mr. Gustas, Robert - Alberta Archaeological Survey (Presenting author)
Keywords: GIS Migration Beringia
Presentation Preference: Oral

Spatial modeling of early prehistoric maritime movements on the Pacific Northwest Coast is important in contemporary archaeology because it can help locate new sites in a landscape which has radically changed over the last 16,000 years. GIS analysis can reveal sites hidden by changing sea levels. Here I present findings from a project which developed a new method for modeling maritime movement using least cost path analysis (LCA) to determine the routes most likely to have been traveled by the Tsimishian of the Dundas Islands, British Columbia over the last 16,000 cal. yr BP. Using multiple cost weighting scenarios, spatial resolutions, and different considerations of overland travel movement, routes through this landscape were predicted. The resulting routes were systemically analyzed and locations with high probabilities of use as movement corridors and stopping points were identified. This work is some of the first to apply LCA to seascapes and marine movement and the results have the potential to lead to a better understanding of migration during the Holocene and Late Pleistocene. Increasing our ability to predict the location of drowned sites on the Northwest Coast is an important step in furthering our understanding of this areas human history.

05 THE CENTRALIZATION AND HIERACHISATION OF INTER-COMMUNAL RELATIONS CONSTITUTED BY ISLAND TOPOGRAPHY: THE CASE OF JAPAN

Author: Professor Mizoguchi, Koji - Kyushu University (Presenting author)
Keywords: topography, network, Japan
Presentation Preference: Oral

The topography and the distribution of watercourses of an island significantly constitutes the topological characteristics of emergent networks of interaction that lead to differential developments of the centrality of network nodes, resulting in inter-communal hierarchisation. By investigating the process of inter-polity hierarchisation that rapidly progressed during the Late Yayoi and the Early Kofun periods of Japan, the paper illustrates how the unique topography and the presence of an inland sea connecting the gateway communities of the Kyushu island and the Kinki region of the Honshu island of the Japanese archipelago resulted in the rapid development of inter-communal hierarchy without the significant uneven distribution of resources, differential developments of social complexity, or that of military powers.

06 FUTUNA AND THE DUTCH IN 1616: CONSEQUENCES OF FIRST CONTACT WITH LEMAIRE AND SCHOUTEN FOR WESTERN POLYNESIAN CULTURE HISTORY

Author: Dr SAND, Christophe - IANCP (Presenting author)
Keywords: Polynesia, first contact
Presentation Preference: Oral

The very first European contact with populations from the central Pacific was with the inhabitants of the islands of Futuna and Alofi by the Dutch crew of Jacob Le Maire and Willem Schouten in 1616, during a Circum navigation commercial expedition. The succession of events that happened during the 12 days of stay at Leava harbor on Futuna's west coast are well known, but there has been to this day no real study of the possible long-term consequences of this very early episode of encounter for the archipelago and more widely, for Western Polynesia. This paper will present a number of data from different fields, to show that indeed it can today be demonstrated that the consequences were severe for the inhabitants of Futuna and devastating for neighboring Alofi. Put in perspective with the known traditional exchange networks in the Fiji-West Polynesian triangle during the second millennium AD, the presence of deadly foreign diseases in Futuna and possibly northern Tonga from the beginning of the 17th century might force us to revise our assumptions about the early appearance of European-linked epidemics in the region and their consequences on the culture history of the central Pacific.

07 FIRST ENCOUNTERS IN OCEANIA AND THEIR CONSEQUENCES (16TH-17TH CENTURIES)

Author: Dr Cruz Berrocal, Maria - Zukunftskolleg/Dept. of History and Sociology
Co-Author: Professor Dr. Sand, Christophe - Institute of Archaeology of New Caledonia and the Pacific (IANCP) (Presenting author)
Keywords: Oceania, contact, impact
Presentation Preference: Oral

Historical narratives on Oceania have over the last two centuries mainly focused on the second half of the 18th century as the significant period of first encounters between Pacific Islanders and Western ships. This has left in the shadows that the first crossing of the region by Magellan was as early as 1521 and more importantly, that during the 16th and 17th centuries, Spanish, Dutch and Portuguese explorers navigated through parts of Polynesia, Melanesia and Micronesia, making regular landfalls and sight contact with many islands and archipelagos. The potentially devastating consequences of these early encounters are well known for Islands like Guam, but appear to have also influenced the cultures and traditions of other archipelagos of Oceania before the better known voyages of Cook, La Pérouse and others sometimes over one century later. Equally important, the role of Pacific Islanders in the spread of those foreign influences along traditional exchange networks needs to be taken into account. Drawing on historical as well as oral tradition and archaeological data collected as part of a wider research project by the senior author, this paper will highlight a series of examples and attempt to show that some of the supposed "traditional" indigenous cultural behaviors might be related to this early period of encounters.

08 INTERACTIONS AND TRAJECTORIES OF ISLAND SOCIETIES IN SOUTHERN VANUATU"

Author: Dr valentin, frederique - CNRS (Presenting author)
Co-Author: Dr Bedford, Stuart - ANU; Dr Flexner, James - University of Sydney; Richard, Shing - VKS; Kuautonga, Takaronga - TKS; Elena, Denise - TKS; William, Robert - University of Sydney; Zinger, Wanda - MNHN
Keywords: colonisation, Vanuatu, Polynesia
Presentation Preference: Oral

South Vanuatu societies of today display many Polynesian cultural features, while the five islands where they live lie geographically in south 'Melanesia'. The peoples of two of the islands – Aniwa and Futuna – speak Polynesian languages. The region was first visited and potentially settled 3000 years ago by people associated with the Lapita Cultural Com-

plex, originating from the north-west. The islands were then re-visited and inhabited 1000 years ago by people associated with a Polynesian population movement originating from the east. A final wave of European colonization occurred less than 200 years ago. Our South Vanuatu Archeological Survey project aims to disentangle the intricate history of interactions within the South Vanuatu islands group, with the other Pacific archipelagoes and with the Europeans using a large array of archaeological, bioarchaeological, and ethnohistorical data. We present here preliminary results based on our first survey in the region and an examination of the Shutler collection assembled during the 1960's.

09 ISLAND-MAINLAND NETWORKS ON THE SEPIK COAST OF NORTHERN PAPUA NEW GUINEA

Author: Dr. Golitko, Mark - University of Notre Dame (Presenting author)
Keywords: PNG, Networks, Pottery
Presentation Preference: Oral

Small offshore islands and their inhabitants are often central to the complex ethnographically documented coastal trading networks of New Guinea. Because these islands typically lack sufficient resources to support the people living on them, islanders carry out obligate trade with mainlanders for critical foodstuffs, while islands are often centers of craft production and middleman transport. This paper explores the archaeological record of the Sepik coast of northern Papua New Guinea, employing geochemical analysis of archaeological and ethnographic museum collections as well as network modelling to examine the development of coastal-mainland trade. Unlike on the south coast of Papua New Guinea, where large-scale island based production and trade monopolies developed around the time of ethnographic observation, production centers on the north coast such as Tumleo Island remained relatively small-scale up to the present. The role of specialist potters on Tumleo and their neighbors on Ali Island, the preeminent middlemen of the coast, is examined in light of major environmental and economic changes to understand why the social world of the north coast has remained extraordinarily stable and resilient over the last two millennia.

10 MID-HOLOCENE ABANDONMENT OF BARROW ISLAND, NORTHERN CARNARVON BIOREGION, NORTH-WEST WESTERN AUSTRALIA

Author: Ms Hook, Fiona - University of Western Australia (Presenting author)
Keywords: archaeomalacology, islands, pleistocene
Presentation Preference: Oral

Boodie Cave is located on the North-West coast of Barrow Island and was first visited by Aboriginal people 51-46 ka when joined to the mainland. At this time the terrestrial faunal assemblages indicate that the cave was used as a bivouac by small groups hunting large kangaroos and euros. These coastal foragers also transported four species of shellfish from the Pleistocene coastline. During this early phase of cave visitation the number of shell species eaten is low. During the Last Glacial Maximum the cave is not visited by people; a common phenomenon in desert lowlands. The coast at that time was over 50 km to the northwest and the hyper-arid conditions may have resulted in greater mobility in the interior and/or tethering on the Pleistocene coast. As the climate ameliorated and the coast moved to within 15 km, the cave was occupied again. The volume and range of marine vertebrate and invertebrate species increased significantly as does the terrestrial signal. By the time Barrow Island formed by 6.8 ka it lay 60 km off the current coastline and was not revisited by Aboriginal people until the 1830s with the arrival of European whalers/pearlers.

The descendants of the people who abandoned Barrow Island exploited the current mainland coastline from precisely 6.8 ka and continued their maritime cultural practices until contact. This paper will explore this early Holocene marine vertebrate and invertebrate record from Barrow Island and the current mainland to explore inter- and intra-cultural relationships and reactions to changing sea levels. Clearly the exploitation of marine resources continues at the level of the bioregion regardless of sea level and coastal configuration. It shows the continued economic and cultural importance of the sea and its bounty throughout the 50 ka human history of his bioregion.

11 MOSQUES IN A CORAL SEA: ANALYTICAL APPROACHES TO HERITAGE MANAGEMENT IN THE MALDIVES

Author: Professor Emeritus Sinclair, Paul - Uppsala Univesity (Presenting author)
Keywords: Mosques Maldives Correspondence
Presentation Preference: Oral

This contribution is based upon study visits to mosques in six atolls in the Maldives in 2014 and follow up analysis at Uppsala University. Attributes from a sample of 56 mosques have been compiled and a multivariate analysis conducted using correspondence analysis. Results show three clear groupings of mosques and these together with results of the GIS analysis are discussed in relation to specific issues of sustainability in the Maldives and broader regional cultural and environmental change comparisons.

12 THE ANTECEDENTS OF 'BARBARIAN' WARE FOUND IN THE ANCHORAGE OF TELL ABU HAWAM

Author: Prof. Artzy, Michal - University of Haifa; Institute for Maritime Studies (Presenting author)
Co-Author: Mr. Martin, Jose - University of Haifa; Universidad Pompeu Fabra
Keywords: Cyprus, Maritime network
Presentation Preference: Oral

During the 2001-2002 excavations in the anchorage at Tell abu Hawam, associated with Hamilton's Late Bronze IIB, Level V, numerous imported ceramics: Mycenaean, Minoan, Anatolian and especially Cypriote wares, was discovered. Those included the usual Cypriote imports to the Levant: White Slip, Base Ring, Monochrome, White Shaved. Also found were numerous members of the Plain White Wheelmade ware, noted for the first time in Israel. Among the non-local wares is an assemblage, who called for a special study since few, if any, published, comparable pieces were found in the literature. While the shapes could, hesitantly, be called similar to wares found in Crete and the Levantine Coast (Barbarian Ware), the dates were not concurrent and provenance studies did not agree with either. Singular sherds of a comparable period were found, however, in Cyprus. Neutron Activation Analysis performed on the group did not provide conclusive provenance, although presence of certain trace elements associated with the Trodoos Mountains hint that it is likely of Cypriot origin. Close parallels with Kalavasos-Ayios Dhimitrios and Enkomi agree with this hypothesis. A ware called 'cookware', found at Maroni-Tsaroukkas, is the closest parallel found so far.
The percentage of Cypriot imports, table wares, domestic ware and wares associated with trade, further accentuates the close interconnection of Tell abu Hawam and Cyprus in the eastern Mediterranean trade network.

13 POINTS OF CONTACT: RHODES AND CHALKI IN THE FIFTH CENTURY BC

Author: Mr Salmon, Nicholas - Birkbeck College, University of London; British Museum (Presenting author)
Keywords: Islands, Aegean, Connectivity
Presentation Preference: Oral

This paper will explore the relationship between the islands of Rhodes and Chalki in the Dodecanese during the fifth century BC. An analysis of grave assemblages from the cemeteries of Kamiros, on the west coast of Rhodes, and Pontamo at Chalki reveals striking similarities in the funerary practices of both settlements. These include the methods of grave construction, consumption of locally produced pottery, and, most significantly, the deposition of pairs of identical grave goods, not least of pots imported from Athens. By considering the channels through which objects could be purchased for specific use as grave goods, this paper assesses the market dynamic of Kamiros and Chalki, arguing that they not only enjoyed a shared economy, but also that there existed a stronger, political bond between these settlements prior to the synoikismos of Rhodes in 408 BC. The overall purpose of the paper is to illustrate how settlements from two neighbouring islands in the Aegean can be interpreted from a regional perspective, with maritime trade serving to amplify, rather than shirk, the traditions of island communities.

14 ISLAND ENCOUNTERS IN THE BRONZE AGE CENTRAL MEDITERRANEAN: A NETWORK APPROACH

Author: Dr Dawson, Helen - Freie Universität Berlin (Presenting author)
Keywords: Lipari, Ustica, identities
Presentation Preference: Oral

The Mediterranean Bronze Age represents an ideal case study of inter-cultural encounters on small islands, given the increasing scope of maritime interaction and population mobility during this period. Interaction in this context has been generally considered via the core-periphery model, which places the eastern Mediterranean and Aegean on a grading scale of complexity decreasing progressively in the central Mediterranean. This is despite archaeological evidence attesting that the latter actively participated in material and cultural exchanges by establishing or taking part in existing networks of interaction. A network perspective offers a less polarised view on such processes, highlighting the importance of a bottom-up approach which can balance internal and external factors. In this paper, I will present insights from network analysis (both quantitative and conceptual) to the material record of the Lipari Islands (Italy), which functioned as maritime hubs in both inter-regional and regional networks, as seen from the presence of Mycenaean-type imports and local imitations. Absence of evidence of inter-regional exchange is also informative: the island of Ustica, not far west of Lipari, notably lacks such imports and can be considered a node in a regional trading network with Sicily. The paper will compare the development of connections shared by the islands at the local, regional, and inter-regional level and use such levels of interaction to clarify changing meanings of insularity with respect to the creation of distinct islander identities in the Bronze Age Mediterranean.

15 CONNECTIVITY OR ISOLATION? THE BALEARIC ISLANDS DURING THE MIDDLE AND LATE BRONZE AGE (CA. 1600-900/850 BC) FROM A ZOOARCHAEOLOGICAL PERSPECTIVE

Author: Ms Valenzuela-Suau, Lua - Pre-doctoral fellow, ArqueoUIB research group, University of the Balearic Islands (Presenting author)
Co-Author: Dr Valenzuela-Lamas, Sílvia - CSIC Institució Milà i Fontanals, C/Egipcíaques, 15 Barcelona (08001)
Keywords: Zooarchaeology, Balearic Islands
Presentation Preference: Oral

The degree of seafaring and connectivity is a major factor of change in island economies and cultures. The analysis of faunal remains from archaeological sites reveals patterns of meat consumption and animal husbandry, which, in turn, reflect environmental conditions, cultural choices and allow us to assess changes through time.
This paper presents the zooarchaeological results from diverse Bronze Age sites from Mallorca and Minorca (Balearic Islands, Spain) to explore how people managed meat resources in different sites and the degree of exchange of livestock between the two islands. This question will be explored through biometrical analyses and stable isotopes (87/86Sr and δ 18O) from sheep tooth enamel.
These aspects are core to Balearic prehistory due to the fact that the Bronze Age constitutes a period of important homogeneity between settlements from Mallorca and Minorca, the two bigger islands, translated into the spatial distribution of settlements, the architectural conception of cyclopean houses, their orientation, the material culture and the funerary practices. This homogeneity between the two islands has been interpreted as a result of a common habitus through which people and ideas were constantly in movement in the archipelago, and here we propose a zooarchaeological approach to investigate such social aspects.

16 DISTANT READING OF STORIED LINES: AN ARCHAEO-HISTORICAL APPROACH TO MAPPING NETWORKS OF LAND USE IN EARLY MODERN ICELAND.

Author: Mr. Palsson, Gisli - Umea University (Presenting author)
Keywords: networks, landuse, interaction
Presentation Preference: Oral

It is a truism nowadays to say that an archaeological site is embedded in extensive networks of relations. But just what are the implications of this networked thinking, and how far do these networks extend?
This presentation explores this question by looking at networks of land use, labour commitment and resource claims recorded in 18th century Icelandic land census documents and supported by landscape survey. Iceland is a large island, but an island nonetheless, and its insularity characterises the networks of interaction that developed since its settlement in the 9th century. The coast acted as an interface between inward- and outward-looking networks; it also provided many productive opportunities for Iceland's settlers, and the management of these coastal resources led to the development of extensive networks of material flow that encompassed several agents in the movement of driftwood, whales, seals and other marine resources from the shores into the hinterland, as well as having a significant impact on how remote areas of Iceland's coast were settled.

Finally, the presentation considers the role of the line in archaeological network analysis. While lines – or edges – in networks are usually represented as straight, the relationships between places rarely are. For Iceland, the rich historic record shows the highly contextual way in which materials moved from coast to countryside, depending on seasonality, political circumstances and personal connections; by emphasising the storiedness of the lines that connect places, the presentation argues for a network analysis not of straight lines, but of knotted, tangled lines reflecting the multiplicity of interaction. Quantitative network techniques allows for the tracing of patterns across large datasets – a distant reading of sorts. But every line is a narrative, and a network analysis of textual data should complement this distant reading with a close reading of the individual line.

17 LINKING INTERNATIONAL AND INTERDISCIPLINARY DATA TO ENABLE SYNTHESIS RESEARCH IN THE NORTH ATLANTIC: THE DATAARC PROJECT

Author: Dr. Strawhacker, Colleen - University of Colorado (Presenting author)
Co-Author: Dr. Opitz, Rachel - University of South Florida; Mr. Brin, Adam - Digital Antiquity, Arizona State University; Dr. Buckland, Philip - Umea University; Mr. Palsson, Gisli - Umea University; Mr. Dawson, Thomas - St. Andrews University; Dr. Mainland, Ingrid - University of Highlands and Islands; Dr. Newton, Anthony - University of Edinburgh; Dr. Streeter, Richard - St. Andrews University; Dr. Cothren, Jackson - University of Arkansas; Dr. McGovern, Thomas - City University of New York; Mr. Ryan, Thomas - City University of New York
Keywords: NorthAtlantic, cyberinfrastructure, synthesis
Presentation Preference: Oral

Uniquely situated at the intersection of research, data, and information from the social sciences, natural sciences, humanities, and informatics, the dataARC project (cyberNABO.org) is ambitiously pursuing the creation of digital tools to link data from a variety of interdisciplinary sources to address grand challenge questions that often require a high quantity of high quality data. These questions include, but are not limited to, how people in the past mediated vulnerabilities to climate change, how people drew upon social networks in times of need or plenty, how and why the fates among various villages and regions differed despite similar challenges, and how people in the past used local knowledge to carefully manage vulnerable resources. To enable and ease the ability for researchers to address these questions with a variety of data sources, the dataARC team is creating digital tools that allow for non-specialist scientists to discover, access, download, and more easily understand data from a number of different sources, including archaeology, the Icelandic Sagas, paleoclimate proxies, and paleoenvironmental records to address broad scale, multidisciplinary questions across the North Atlantic Islands, including Iceland, Greenland, and Orkney. Additional outreach tools and stories will be created throughout the project to better engage the general public. The proposed presentation will provide an overview of dataARC objectives and progress, including the introduction of an initial prototype of an online tool for feedback from the wider archaeological community.

18 ' I AM A ROCK, I AM AN ISLAND'

Author: Prof Zubrow, Ezra - University at Buffalo and University of Toronto (Presenting author)
Co-Author: Prof Lindstrom, Torill C. - University at Bergen; Ms. Ruhl, Erika - University at Buffalo; Ms. Hoffmann, Sarah - University at Buffalo
Keywords: Isolation, Centrality, Gatekeeping
Presentation Preference: Oral

This paper reconsiders the conceptual basis of intra- and inter-island relationships in the context of archaeology, Understudied, spatially constrained, with turbulent colonial histories we argue that islands need not be isolated phenomena geographically, ecologically or culturally. Using 21st century equilibrium theory and gateway theory we suggest that islands may be steppingstones and in some contexts even central places. We conclude that if one views the complex dynamic interconnections of settler and indigenous through the lens of locality, steady state sustainability, heterogeneity, gradualism, and interdependence, that a supply side analysis indicates that there are strong forces that force island colonialism towards verticality of the trade process if not the production process. Examples are provided from the North including such islands as Osterøy and Radöy in Norway as well as analogous examples from Aland and Lofoten Island as well as Kiril and Aleutian island chains.

152 NOVEL SCIENTIFIC DEVELOPMENTS IN THE RECONSTRUCTION OF THE ARCHAEOLOGY OF MINING AND METALLURGY AND ITS IMPACT ON THE ENVIRONMENT

Theme: 6. Interpreting the archaeological record
Author: Mighall, Tim (United Kingdom) - University of Aberdeen
Co-Author(s): Oeggl, Klaus (Austria) - University of InnsbruckMartinez Cortizas, Antonio (Spain) - University of Santiago de Compostela
Keywords: mining, metallurgy, palynology, geochemistry, archaeology
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The aim of this session is to promote interdisciplinary approaches to the study of mining and metallurgy and its diverse impact on the environment. Human activity is a major influence on the structure of vegetation communities from the Neolithic onwards. Generally this encompasses agricultural and domestic activities, both representing only a part of the subsistence economy of past human societies. But since the Chalcolithic, the procurement of ores and the manufacture of metal artefacts became integral to past human societies and this industry has left noticeable traces in the biotic and abiotic environment still observable today. Visible signs of millennia-old metallurgic activities in form of land subsidence, glory holes, tailings, etc., are still recognized in the landscape, and attest to the scale of past and more recent mining and metallurgy. Ore separation, roasting and melting also has released volatile heavy metals which are archived in limnic and terrestrial deposits. The session organisers would welcome contributions that combine palaeo-environmental information obtained from different sources, including palynology, geochemistry and archaeology. The adoption of interdisciplinary approaches should serve to address relevant environmental and archaeological research questions:

- novel scientific developments in qualitative and quantitative reconstruction of mining activities, related subsistence strategies and its environmental consequences
- detection of ancient mining and past pollution
- identifying production activities
- destruction or management of woodlands?
- discriminating between mining/metallurgy and other land use practices
- suitable statistical methodologies to treat and interpret palynological and geochemical data

01 LINKING METAL HOARDING PRACTICES AND PALAEOPOLLUTION RECORDS IN ATLANTIC EUROPEAN PREHISTORY

Author: Dr Armada, Xose-Lois - Institute of Heritage Sciences (Incipit), Spanish National Research Council (CSIC) (Presenting author)
Co-Author: Prof Martinez-Cortizas, Antonio - Departamento de Edafología y Química Agrícola, University of Santiago de Compostela; Dr Lopez-Merino, Lourdes - Institute of Environment, Health and Societies, Brunel University London; Prof Martinon-Torres, Marcos - UCL Institute of Archaeology; Dr Mighall, Tim - The School of Geosciences, University of Aberdeen; Dr Montero-Ruiz, Ignacio - Institute of History, Spanish National Research Council (CSIC); Dr Silva-Sanchez, Noemi - Departamento de Edafología y Química Agrícola, University of Santiago de Compostela
Keywords: Archaeometallurgy, Palaeoenvironment, Hoards
Presentation Preference: Oral

The hoarding of metals was a widespread phenomenon in later prehistoric Europe and particularly intense in the Atlantic façade of the continent. The nature and scale of this phenomenon varies depending on chronology and geographic area, but the suitability of hoards for periodisation and quantification offers an opportunity to link the cycles of metal hoarding to the palaeoenvironmental records of atmospheric pollution caused by mining and metallurgical activities. While palaeopollution studies using peats and other environmental archives are making a substantial contribution to our understanding of the chronology and intensity of ancient mining and metallurgical activities, their connection to the hoarding cycles has never before been explored. The aim of this paper is to assess the potential and limitations of such an approach on the basis of 1) a critical review of research on prehistoric metal pollution and metal hoards in Atlantic Europe; and 2) a pilot study of a selected area in the Atlantic façade of NW Iberia.
To this end, we will quantify the variable scale of prehistoric metal hoarding over time and will cross this information with the sequences of metal pollution as recorded in the peats from Xistral Mountains (Galicia) and Alto de la Espina (La Molina mire, Asturias). In addition, we will explore for possible correlations between the isotopic signatures of the archaeological and environmental samples. A recent study of La Molina mire shows the highest levels of prehistoric atmospheric metal pollution in NW Iberia during the Late Bronze Age, concurrent with an increase in metal hoarding. However, the first episodes of atmospheric pollution from mining and metallurgical activities are recorded at the end of the fourth millennium BC or the beginning of the third, which raises questions about the archaeological visibility of early metal smelting in the region.

02 MEDIEVAL MINING ACTIVITIES AND THEIR IMPACT ON THE LANDSCAPE IN THE ERZGEBIRGE AREA (SAXONY AND BOHEMIA)

Author: Dr. Tolksdorf, Johann Friedrich - Landesamt für Archäologie Sachsen / Archaeological State Heritage Office in Saxony; ArchaeoMontan research group (Presenting author)
Co-Author: Dr. Hemker, Christiane - Landesamt für Archäologie Sachsen / Archaeological State Heritage Office in Saxony; ArchaeoMontan research group
Keywords: Geoarchaeology, land-use reconstruction
Presentation Preference: Oral

The onset of mining in the 12th century transformed the Erzgebirge area (Saxony and Bohemia) from cultural backwater to one of the most important mining areas in Central Europe. Although most of the remains from this early period have been destroyed by later activities, 13th century mining structures were discovered at Dippoldiswalde and Niederpöbel. With excellent conditions for the preservation of organic material and depth of more than 29 m below the modern surface, these feature provide an unique insight into the first decades of medieval mining in this area.

The joint German-Czech EU-founded project "ArchaeoMontan" has been established to combine documentation and research of these underground structures with archaeological and geoarchaeological reconstruction of the past economy and environment.

Changes in vegetation composition and resource exploitation are traced by combined dendrochronological studies of more than 3000 timbers, anthracological assessment of charcoal kilns and palynological and macrobotanical analyses. A set of palaeopedological and geochemical approaches is applied to study the local remobilisation of sediments in the form of colluvia or deposits of placer mining as well as the reconstruction of changing land-use intensities in wider catchments based on alluvial sedimentation.

Our results indicate that the onset and intensity of mining varied on a regional to local scale. While some areas prove that mining and smelting led to forest clearances and triggered local soil erosion and alluvial sedimentation, other areas seem to be much less affected until modern times. Consequently, archaeological heritage management needs to focus on a very local scale in the future and should take advantage of smaller environmental archives that reflect the rather local catchments.

03 WHEN PAST HUMAN ACTIVITIES IMPACT PRESENT-DAY ENVIRONMENT: TRACKING GEOCHEMICAL ANOMALIES FROM ANCIENT MINES IN THE NORTHERN FRENCH ALPS.

Author: Dr CAMIZULI, Estelle - EDYTEM – UMR 5204 CNRS, Université Savoie Mont Blanc (France); ARSCAN – UMR 7041 CNRS, Universités Paris-Lumières et Paris-Sorbonne (France) (Presenting author)
Co-Author: Dr. ROSSI, Magali - EDYTEM – UMR 5204 CNRS, Université Savoie Mont Blanc (France); Prof. GASQUET, Dominique - EDYTEM – UMR 5204 CNRS, Université Savoie Mont Blanc (France)
Keywords: mines, metals, statistics
Presentation Preference: Oral

The Northern French Alps have experienced several mining periods from the Bronze Age to the 19th-20th century. An archaeological inventory has shown that polymetallic ore deposits are numerous, of small size but widely spread all over the territory. The aim of this study was to investigate the long-term dispersal of trace metals and their impact on the environment long after the mine closure. Several statistical methods derived from modern mining prospecting and ecological management plan were applied to the stream bed sediment database of the French Geological Survey (BRGM; 6892 samples available). These sediments represent composite erosion products of rocks outcropping in the catchment area. The statistical analysis helps to discriminate background from positive geochemical anomalies that characterize areas with high ore deposit potential. In order to produce mineral prospectivity maps, geochemical data were treated by two elemental approaches (Exploratory Data Analysis and fractal-based techniques) and a multi-elemental approach based on eco-toxicological thresholds (Sediment Quality Index). Very high anomaly can be found (e.g. maximum concentration of Pb reaches 8900 mg/kg). The "poor" and "marginal" sediment quality indexes represent, respectively, 1.38 % and 3.93 % of the analyzed streambed samples. If some positive anomalies are clearly related to the geological background, most localized anomalies are spatially related the location of ancient mining sites.
This multi-disciplinary study (combining archaeological, geochemical and geological data, prospecting techniques, spatial approach and eco-toxicological thresholds) shows that the mining heritage is still traceable in the Northern French Alps. Positive geochemical anomalies in streambed sediments are highlighted downstream the main mining sites that are no longer exploited. These statistical methods can be used by archaeologists as a tool to identify unknown ancient mining sites but also to monitor long-term contamination of the environment related to past human activities.

04 ASSESSING THE SIGNIFICANCE OF VEGETATION CHANGES ASSOCIATED WITH EARLY MINING AND METALLURGY USING CHANGEPOINT ANALYSIS

Author: Dr. Mighall, Tim - University of Aberdeen (Presenting author)
Co-Author: Dr Timberlake, Simon - University of Cambridge; Prof Martinez Cortizas, Antonio - University of Santiago de Compostela; Dr Silva Sanchez, Noemi - University of Santiago de Compostela
Keywords: vegetation, mining, changepoint
Presentation Preference: Oral

The impact of early mining and metallurgy on vegetation, particularly woodlands, has been well debated with changes considered to range from severe destruction to a degree of resilience whereby total woodland cover was largely unaffected. In this instance, the most abundant trees in forest/woodland appeared to be adversely affected or composition altered and some degree of selectivity of trees seems to have taken place. But sometimes it is difficult to establish the significance of changes in vegetation associated with metallurgical activities and how it might influence the trajectory of vegetation development. To examine this relationship, we present pollen data from a number of sites in the British Isles and apply changepoint analysis to ascertain which land use changes were more influential on the development of vegetation compared to mining or metallurgy.

05 MERCURY MINING IN IDRIJA, SLOVENIA: MERCURY SMELTING TECHNIQUES AT THE BEGINNING OF THE EARLY MODERN PERIOD

Author: Dr. Kawashima, Takamune - Yamaguchi University
Co-Author: Prof. J. Hudson, Mark - Mt. Fuji World Heritage Centre for Mountain Research (Presenting author); Mr. Rupnik, Janez - Avgusta d.o.o.
Keywords: Idrija, mercury, pottery
Presentation Preference: Oral

After the discovery of the mercury mine of Idrija in 1490 specially made pottery was used for mercury smelting until the mid-17th century. At this moment 21 mercury ore roasting sites are found in the woods around Idrija, where the pottery shards are accumulated as thick layers. These sites are not archaeologically investigated, except a site excavated in the early 20th century. Probably because of the abundance of fragmented pottery shards and the description of the use in the book, De Re Metallica, pottery has not been the object of archaeological studies. According to the general survey by the authors, however, there are several typological differences on the pottery, which could suggest the different workshops, artisans, chronological change, etc. While the ore roasting technique itself must have been the same as shown in De Re Metallica, many things regarding the mercury smelting industry as a whole are unclear. For example, according to historical records, pottery was supplied from other towns approximately 40km away from Idrija. Undoubtedly pottery was brought to Idrija, but the number of mercury ore roasting sites of the same period and the consumed amount of pottery in a site were not clarified. Mercury smelting was a complex industry associated with ceramic production and forest industry. Most sites are located in the west of the town, which could have been influenced by the woods for fuel as well as the mercury mine. This paper investigates the mercury ore roasting pottery and the sites which would provide us basic information of the early stage of mercury smelting in Idrija, and the environmental influence of these sites which still keep tons of mercury.

06 SIGNALS OF MINING/METALLURGY IN ARCHAEOLOGICAL BONE

Author: PhD Lopez Costas, Olalla - Ciencia do Sistema Terra - Universidade de Santiago de Compostela; Archaeological Research Laboratory, Stockholm University; Laboratorio de Antropología, Departamento de Medicina Legal, Toxicología y Antropología Física, Universidad de Granada
Co-Author: Prof Martinez Cortizas, Antonio - Ciencia do Sistema Terra - Universidade de Santiago de Compostela (Presenting author); Ms Pérez Rodríguez, Marta - Ciencia do Sistema Terra - Universidade de Santiago de Compostela
Keywords: Lead, mercury, skeletons
Presentation Preference: Oral

Mining and metallurgic activities have resulted in metal pollution of the environment since millennia, as attested by research performed on several types of environmental archives and archaeological sites. Investigations in human remains, although much scarce, have also found varying metal contents depending on the period/phase studied. Previous research developed in NW Spain (using peatlands as archives) enabled to reconstruct the history of atmospheric metal pollution since 8000 years ago, revealing the key role of mining/metallurgy. But up to now, no direct relationship between the environmental signal and that of human remains has been established.
With this aim, we analysed lead and mercury contents in human bones from a rural cemetery in NW Spain (A Lanzada, Pontevedra) that was in use for seven centuries (AD 1st-7th), covering the rise and fall of the Roman Empire. Concentrations in bone were 0.1-20.9 µgg-1 and 10-516 ngg-1, for Pb and Hg respectively. Our results show significantly higher ($p<0.01$) values of both metals in bones from individuals that lived during Roman (AD 1st-4th) compared to individuals of post-Roman (AD 5st-7th) times. These results fit nicely with the reconstruction obtained using environmental archives, as the Roman period stands out as a climax in atmospheric pollution that declined with the collapse of the Empire. For the few available dated individuals (10) the trend in metal concentrations follows the environmental curve.
Although exposure to metals is a complex process, the distinct Roman signal may be the result of direct inhalation and intake (food and drink). Thus, atmospheric pollution during Roman times left its toxic signal in humans from even the very edge of the Empire.

155 THE INTERACTION BETWEEN FORENSIC ARCHAEOLOGY AND BIOARCHAEOLOGY

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Groen, Mike (Netherlands) - Netherlands Forensic Institute; Leiden University, Faculty of Archaeology
Co-Author(s): Barone, Pier Matteo (Italy) - The American University of RomeShvedchikova, Tatyana (Russia) - Institute of Archaeology of Russian Academy of Sciences
Keywords: Forensic archaeology, bioarchaeology, forensic science
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

This session will explore the similarities and differences between forensic archaeology and bioarchaeology. In doing so, it will highlight the different research strategies that are of interest to archaeologists working in traditional archaeology and/or forensics, in various contexts. Forensic archaeology combines archaeological theory and methodology with the theory and methodology of forensic sciences, within the context of (criminal) law. Forensic archaeological investigation focuses on the contextual documentation and collection of evidence at a crime scenes, places of incident or disaster scenes, and on the reconstruction of the human and natural activities that took place at these sites, in order to present these findings at a court case.
Bioarchaeology, as an archaeological science, focuses on the identification of human remains in their socio-cultural context - for example with regard to sex, age, development,

geographical origin, health and death - and the diachronic processes that may have changed the intrinsic properties of these remains. In addition, bioarchaeology focuses on the reconstruction of the lifestyle of ancient populations. Its goals are therefore, to some extent, comparable to those within forensic archaeology. Concepts from bioarchaeology can be applied in forensic archaeology and consequently, in forensic sciences. Accordingly, theories and methodologies employed in forensic sciences are also of value in bioarchaeological research.

01 CRIME IN PREHISTORY. FORENSIC ANALYSIS OF COPPER AGE MASS GRAVE FROM CROATIA

Author: Dr Novak, Mario - Institute for Anthropological Research (Presenting author)
Co-Author: Dr Jankovic, Ivor - Institute for Anthropological Research; Dr Balen, Jacqueline - Archaeological Museum in Zagreb; Dr Ahern, James - University of Wyoming; Dr Premuzic, Zrinka - Institute for Anthropological Research; Dr Cavka, Mislav - University Hospital Dubrava; Dr Potrebica, Hrvoje - University of Zagreb
Keywords: Croatia, Chalcolithic, violence
Presentation Preference: Oral

During archaeological rescue excavations carried out in 2007 at Potočani in continental Croatia, a pit containing numerous human skeletal remains was discovered. The remains were mostly articulated but also comingled and showed no clear pattern of organization. There were no associated artefacts, just a few pottery fragments probably belonging to the Copper Age Lasinja Culture (c. 4300 to 3950 BCE). Three human bone samples from different layers were dated to around 4100 cal BCE by radiocarbon analysis. The radiocarbon dates, combined with other aspects of archaeological context, indicate that the deposition was a single episode rather than a long-term accumulation. Conventional bioarchaeological analysis suggests the presence of at least 41 individuals of all ages and both sexes with many crania exhibiting various perimortem trauma. We used forensic approach in order to reconstruct the patterning and morphology of perimortem cranial injuries. These include blunt force trauma as well as cuts and penetrating injuries indicating the use of different weapons/tools. All mentioned aspects suggest a single violent encounter (massacre).

02 BRONZE AGE CHILDREN BURIALS: BIOARCHAEOLOGICAL CASE STUDY FROM THE SOUTHERN TRANS-URALS

Author: Dr Sharapova, Svetlana - Institute of History and Archaeology Urals Branch of RAS (Presenting author)
Co-Author: Loyer, Jeanna - Archaeology & Palaeoecology School of Natural and Built Environment Queen's University Belfast Belfast, BT7 1NN Northern Ireland, UK
Keywords: Bronze Age, bioarchaeology
Presentation Preference: Oral

The paper deals with preliminary results of osteological and paleopathological analyses, which is being undertaken for skeletal remains found in the Bronze Age cemetery Neplujevsky (Kartaly district of Chelyabinsk region, Russia). Two excavated kurgans (№ 5 и № 9) yielded six individual only children burials of various preservation. The set of accompanied grave goods includes ceramics while all pots were found both inside interments and special pot`s deposited structures. Skeletal remains of the majority provide evidence of non-specific stress markers - cribra orbitalia, linear enamel hypoplasia, dental attrition, periosteal new bone formation. Small number of observed osteological defects might be explained by taphocomplex (poor preservation of immature skeletal materials, looted burials and/or perturbation by animals). The authors stress that children studied here had suffered decease or infection shortly before death and survived, but finally died. From the other side, individuals without pathologies were, probably, not healthier than others as they did not have good immunity and died quickly with no time for the disease to leave a mark on the bones. Various infections and social environment are among those factors which determined pathological status of the children discussed here.
This research was supported by Russian Science Foundation (project № 16-18-10332).

03 SCULL WITH TREPANATION OF THE ERA OF THE GREAT MIGRATION OF PEOPLES FROM THE PERM URALS

Author: Bryukhova, Natalia - Perm Scientific Center, the Ural Branch of the Russian Academy of Sciences (Presenting author)
Keywords: Perm Urals, trepanation,
Presentation Preference: Poster

The paper deals with cases of damage to the calvarias, fixed on a material from burials burial mounds era of the Great Migration of peoples from the Perm Urals. Burial mounds appear on the Upper Kama in the IV century AD and there are up to VII century AD. Anthropological material was obtained from the burials of three burial mounds: Kalashnikovsky V-VI centuries AD, Chazjovsky I end VI-VII centuries AD and Mitinsky end IV-VI centuries AD.
Of the 15 examined skulls on the 9 observed traces of repeated interventions in the bone structure of the cranial vault. All damages are signs of the healing, except in the one case. Slice unhealed intervention in the skull bone has been studied with a microscope. All these bone defects have similar morphology and localization. Based on the observations, the damages are interpreted as signs of the lifetime trepanation with prevalence of cases of the symbolic trepanations.
The evidences of tampering in the integrity of the cranial vault bones weren't found on the skulls from the later burial grounds from the Perm region. Thus, the tradition of trepanations disappeared after the burial mounds ceased to exist.

04 INSECTS AS SILENT WITNESSES TO PAST WARFARE: FORENSIC ENTOMOLOGY AND THE INVESTIGATION OF A CONFLICT SCENE AT NUNALLEQ, SOUTHWESTERN ALASKA

Author: Forbes, Veronique - Université de Bordeaux (Presenting author)
Co-Author: Huchet, Jean-Bernard - Université de Bordeaux; McManus, Ellen - University of Aberdeen; Masson-Maclean, Edouard - University of Aberdeen; Knecht, Rick - University of Aberdeen
Keywords: Conflict, Insects, Alaska
Presentation Preference: Oral

Forensic entomology is the science that studies insects recovered from human remains and applies them towards aiding criminal investigations. Classically, such evidence has been used to determine the timing, causes, and circumstances of death. The principles and methods of forensic entomology can also be applied to solving archaeological questions. The analysis of necrophagous flies and beetles extracted from tombs and mummies has been employed in reconstructing the mortuary practices of various past peoples in Europe, Africa and South America. Although the potential of forensic (archaeo)entomology to investigate violence in the deeper past may seem self-evident, the approach has never been tested in such a context. This paper presents the result of a pilot study that incorporates the methods and principles of forensic entomology in the investigation of a scene of indigenous conflict. At Nunalleq, a pre-contact (15th-18th centuries AD) Yup'ik site in southwestern Alaska, excavations revealed the remains of a large sod village that

appears to have been abandoned following an attack. The final occupation layers are overlain by charred roof sods strewn with projectile points and shafts and associated with these deposits are the remains of some of the victims. Although Yup'ik oral history contains numerous tales and legends associated with a period of intense violence, referred to as the 'Bow-and-Arrow-Wars,' Nunalleq is the only site where evidence of this conflict has been extensively excavated. In order to better characterise the timing (seasonality), spatiality and sequence of events that characterised the attack on Nunalleq, we integrate the results of high-resolution archaeoentomological analyses with other bioarchaeological and artefactual data. In doing so, we aim to demonstrate that by incorporating innovative methods from forensic sciences in archaeological investigations of past violence, it is possible to reconstruct detailed, engaging and historically accurate narratives of past conflict based on physical evidence.

05 IMPROVING GEOLOCATION WITH FINDS OF FUNGAL SPORES AND OTHER NON-POLLEN PALYNOMORPHS

Author: Enevold, Renée - Aarhus University; Moesgaard Museum (Presenting author)
Keywords: Non-pollen palynomorphs, Geolocation
Presentation Preference: Oral

Non-pollen palynomorphs are parts of microscopic organisms such as fungi, algae, cyanobacteria, amoebae and micro-invertebrates or microscopic fragments of larger organisms such as vascular plants. These are numerous in soils and sediments and their presence varies with the environment. They are durable and can withstand common organic decomposition as well as palynological preparation procedures. The palynomorphs other than pollen in the pollen slides were previously ignored by palynologists until researcher Bas van Geel at Vrije University of Amsterdam started to systematically record them in the mid-seventies. Since then, and especially during the last few decades, more and more non-pollen palynomorphs have been identified to an organism and thousands have been described and assigned to an environment. They are, together with pollen, used in investigations and geolocations to pinpoint a locality or to place a person on the scene of crime as well as being a valuable contribution to the study of a variety of archaeological questions. This presentation will discuss the use of non-pollen palynomorphs in bioarchaeology and forensic archaeology and present some preliminary results from a current PhD-project regarding the analysis of non-pollen palynomorphs in Danish soils and sediments.

06 BODIES AND BURIALS: DIFFERENT CONTEXTS SAME TECHNIQUES.

Author: Professor Barone, Pier Matteo - The American University of Rome (Presenting author)
Keywords: Burials, Bodies, GPR
Presentation Preference: Oral

Forensic Archaeology can be defined as "the application of archaeological theories and recordation and recovery methods to processing of criminal scenes". A criminal investigation can benefit by having the assistance of a forensic archaeologist at a crime scene involving human documentation and general delineation of man-made and natural context. Beside this forensic expertise, Forensic Geophysics is an useful and complementary science used for forensic purposes. It studies, searches, localises and maps buried objects or targets (from weapons or metallic barrels till human burials and bunkers) beneath the soil or the water, using geophysics tools. Geophysical methods have the capability to aid the research and the recovery of these targets, because they can investigate large areas non-destructively and rapidly where a suspect, illegal burial or, in general, a forensic target was tried to hide in the subsoil. When in the subsurface there is a contrast of physical properties between a target and the material in which it is buried, it is possible to individuate and define precisely the concealing place of the searched target, recognising, for example, evidences of human soil occupation or excavation, both recent and older. The Ground Penetrating Radar (GPR) is one of the most useful geophysical tools able to investigate targets beneath the soil. This technique has had great results in different applications, in particular in archaeology, and it could be a great improvement if used normally in forensic archaeology.
The aim of this presentation is to highlight not only the potentiality of both forensic approaches together, but also in which way they could be helpful during the forensic investigations, in terms of high-quality results and fast acquisition for detecting burials and human remains coming from different contexts, ages, and scenarios.

07 TAPHONOMIC OBSERVATIONS OF BURIED HUMAN REMAINS IN RECENT CLANDESTINE AND CEMETERY GRAVES IN THE NETHERLANDS

Author: MA BEng de Leeuwe, Roosje - Netherlands Forensic Institute (Presenting author)
Keywords: Forensic Archaeology
Presentation Preference: Oral

This paper summarizes and compares the taphonomic observations on buried human remains, collected by forensic archaeologists from the Netherlands Forensic Institute (NFI) over a eleven-year time period. The case work of the NFI forensic archaeologists consists of assisting the police during searches for missing and presumably buried persons, assisting at crime scenes involving buried or scattered human remains and/or objects, and exhuming unknown individuals for identification on cemeteries. The observations on human taphonomy derive from individuals buried in a clandestine grave or in a cemetery grave. Variables contain information on the duration of burial, the decomposition stage underground, the use of body bags, the soil type, the burial depth, the circumstances under which the corpse was found before burial, the coffins, flora and fauna in and around the grave and the differences between observations from cemetery graves and clandestinely dug graves.

08 THE INTERACTION BETWEEN FORENSIC ARCHAEOLOGY AND BIOARCHAEOLOGY IN SWITZERLAND

Author: Dr. Lösch, Sandra - Institute of Forensic Medicine, University of Bern, Switzerland (Presenting author)
Co-Author: Prof. Hafner, Albert - Institute of Archaeological Science, University of Bern, Switzerland; Prof. Jackowski, Christian - Institute of Forensic Medicine, University of Bern, Switzerland
Keywords: bioarchaeology, forensic anthropology
Presentation Preference: Oral

The discipline of "Forensic Archaeology" was recently introduced in Switzerland. Its basic concept was presented and is mainly applied by the Institute of Forensic Medicine in cooperation with the Institute of Archaeological Science of the University of Bern. The Institute of Forensic Medicine in the federal capital Bern is the only facility in the country with a Department of Physical Anthropology. In Switzerland, the staff members of the Institute of Forensic Medicine are called to perform the on-site assessment in forensic cases. In general, three cantonal bodies build the scope in forensic casework: Police/ Crime Scene Unit, Prosecution, and University. However, due to the Swiss federal system all 26 cantons are organized separately and their processes are slightly different.
The Department of Physical Anthropology was integrated in the year 2010 into the Institute of Forensic Medicine and covers forensic cases concerning skeletal or mummified remains, as well as archaeological fieldwork. The latter is the major part due to few forensic cases in the catchment area in relation to the large amount of archaeological exca-

vations. In the Canton of Bern it is regulated by law to inform the Archaeological Service if any finds, e.g. bones, are made below the surface, which often happens at construction sites.
In 2012 the Department attended at the EMFA in Den Haag and is founding member of the Society since then. In 2016 a workshop with the topic of Forensic Archaeology was organised at the University of Bern in order to bring the specialists in Archaeology and Anthropology together with the responsible persons in the Crime Scene Unit to discuss the perspectives of this discipline in Switzerland.

09 FORENSIC ARCHAEOLOGY IN RUSSIA: SETTING UP A DISCIPLINE

Author: Dr. Shvedchikova, Tatiana - Institute of Archaeology Russian Academy of Sciences (Presenting author)
Keywords: forensic archaeology, bioarchaeology
Presentation Preference: Oral

The progressive development of Forensic Archaeology over the period of last years showed us how archaeological methods and techniques can positively contribute to the criminal investigation. The appearance and establishing of the discipline vary from country to country due to the special aspects of legislative systems and organization of the archaeological research. The presentation gives the overview of the interaction between the criminal law, forensic investigations and bioarcheological studies in Russia. It also gives the examples of fruitful collaboration between the forensic experts and physical anthropologists and the first steps towards the application of the archaeological theories in processing the criminal cases.

10 AUTOFLUORESCENCE OF SKELETAL HUMAN REMAINS: A NEW DATING TECHNIQUE?

Author: Groen, Mike - NFI; Leiden University (Presenting author)
Keywords: dating, forensics,autofluorescence
Presentation Preference: Oral

In forensic investigations it is of great importance to access the post-mortem age of skeletonised human remains as fast as possible. In the Netherlands, since the missing person's register dates back to 1920, the initial concern is if the remains found date before or after 1920. If later, the remains found could be forensically relevant. However, there seems to be no easy and quick method to (statistically) differentiate between the pre and post 1920 time frames. This paper focuses on the possibility of using autofluorescence to access the post-mortem age of human skeletal remains. Autofluorescence, or naturally-occurring fluorescence, is the natural emission of light that can be observed in many plant and animal tissues when exposed to ultraviolet (UV) or visible electromagnetic radiation. This emission can be quantified, for example using a fluorescence spectrometer, and statistically modelled. Tests performed on femoral fragments at the Netherlands Forensic Institute (NFI) and the Amsterdam Medical Centre (AMC) have shown that the natural fluorescence signal decreases progressively with post-mortem age. Additionally, a correlation was found between the Apatite/FAD fluorescence ratio and the post-mortem age, showing a statistically significant difference between pre and post 1920 samples. However, it was also revealed that the brightness of the fluorescence signal is co-dependent with the calendar age of the donor, the physiology and anatomy of the bone and the diagenetic exchange between bone tissue and the soil/water matrix where the examined human remains were found.

156 RECORDING SCHEMES FOR ARTEFACTS FOUND BY PRIVATE PERSONS: APPROACHES, OPPORTUNITIES AND CHALLENGES

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Heeren, Stijn (Netherlands) - Vrije Universiteit Amsterdam
Co-Author(s): Wigg-Wolf, David (Germany) - Deutsches Archäologisches Institut, FrankfurtRoymans, Nico (Netherlands) - Vrije Universiteit Amsterdam
Keywords: private finds, artefacts crowdsourcing
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

In many countries artefacts found during archaeological fieldwork are the most privileged source for academic research, while private collections, of which many exist and can hold high numbers of artefacts, are mostly disregarded. These collections, which can result from traditional fieldwalking or from using metal detectors by private individuals, do however have a huge potential for research as well. In some countries, like England and Denmark, this has been realized for a long time and these collections are recorded by professionals. However, this approach remained an exception until recently. In the last few years, more countries and regions have started to records finds of archaeological relevance made by the larger public, or are planning to do so in the near future, for instance in Flanders, The Netherlands and Finland.
At the same time, developments in digital humanities have expanded the research potential of these digital datasets on artefacts to the international level. Efforts were made to link up different national datasets by digital means. One of the aims of the session is to explore international cooperation in order to to link national datasets concerning archaeological small finds.

The goal of this session is to:
1) Offer case studies of how the recording of finds is organized in various countries
2) Highlight some of the challenges that are faced and opportunities that arise when engaging with professionals and reaching out to non-professional archaeologists and collectors
3) Sketch opportunities that arise from new digital techniques, allowing to connect different datasets

01 THE RHINELAND APPROACH TO RECORDING ARTEFACTS FOUND BY PRIVATE PERSONS

Author: Dr. Brüggler, Marion - LVR-Amt für Bodendenkmalpflege (Presenting author)
Keywords: metal detecting
Presentation Preference: Oral

The Federal Republic of Germany consists of 16 constituent states with 16 different heritage laws. This leads to a wide variance of approaches concerning our topic. In the state of Northrhine-Westfalia, there exists one law, but three heritage services: Rhineland, Westfalia and Cologne, again with different practices. The proposed paper will present a case study: It will deal with procedures in the Rhineland (excluding Cologne), i.e. an area of more than 12,000 km^2 and ca. 8.5 mio inhabitants. The Rhineland is attractive to metal detectorists also from abroad especially for its Roman sites and post-medieval military operations, not the least of which are those at the end of WW II. Metal detecting is allowed only with a licence, excluding forests, listed sites and obligatory report of finds. Finds are usually returned to the finder with the exception of "scientifically important finds". As heritage service, one of our aims is to have as much data as possible for our statements on area development planning, but gaining more insight into already known sites is equally important. We therefore record the finds of private persons in our GIS-based database, which is only accessible to archaeologists. In the last few years, the number of licensed detectorists has increased rapidly, which is expanding our knowledge, but is also putting increasing pressure on our workload. Even though some collections are evaluated scientifically, not only by the Heritage Service but also by the LVR-Landesmuseum Bonn, no overall scheme for an evaluation exists. Unfortunately, also the number of illegal detectorists is growing with the destruction of sites and features and loss of knowledge this involves.

02 ACADEMIC ARCHAEOLOGY AND ARTEFACTS FOUND BY PRIVATE PERSONS IN SOUTH MORAVIA, CZECH REPUBLIC - A CASE STUDY

Author: PhD Komoróczy, Balázs - Institut of Archaeology of the Czech Academy of Sciences Brno (Presenting author)
Co-Author: Mgr. Růžičková, Pavla - Institut of Archaeology of the Czech Academy of Sciences Brno; PhD Vlach, Marek - Institut of Archaeology of the Czech Academy of Sciences Brno
Keywords: artefacts detector publicity
Presentation Preference: Oral

The problems of the non-professional collecting of archaeological finds by metal detector are a significant presence in Czech archaeology. However, professionals so far have not been able to agree upon a unified stance on the issue. Research under B. Komoróczy demonstrated the necessity of recording new finds and the importance of methods of their registration and sharing, as well as the need to identify useful tools for communication with the general public. Within our work frame it has been established that a model which incorporates tools of individual and collective education, as well as a sophisticated system of evidence gathering and the conservation of finds works best. Our working relationship with private people tries to build up behavioural patterns for use in other professional institutions.
At the beginning of 2017 our team conducted a survey on the problems of metal detector finds which can provide representative data about current tendencies in opinions within both the professional field and the larger group of amateur metal detectorists.
In this paper individual applied tools and their general outcomes will be presented, as well as opportunities which exist providing an appropriate strategy for all periods involving metal is chosen.

03 THE CHALLENGERS: ARCHAEOLOGISTS, PEOPLE AND ARTEFACTS OF WEST POMERANIA IN POLAND

Author: Dr Chmiel-Chrzanowska, Marta - University of Szczecin (Presenting author)
Keywords: Artefacts, Cooperation, Pomerania
Presentation Preference: Oral

The following paper will focus on cooperation between private individuals and archeologists in western part of Pomerania (NW Poland). Private collectors and archaeologists have a difficult relation here.
The reason for the difficult relation between archaeologists and private collectors lie in the complicated latest political history. Completely new standards were implemented in Western Pomerania, first after the Second World War, and again after the collapse of the USSR.
Over the last 10 years successes were reached, as the result of co-operation between archaeologists, the police, other state institutions and private collectors. The contribution will highlight the current situation, and the reasons for the situation.

04 MAKING PUBLIC FINDS PUBLIC: RECORDING PORTABLE ANTIQUITIES DISCOVERED BY THE PUBLIC IN ENGLAND AND WALES

Author: Dr Lewis, Michael - British Museum (Presenting author)
Keywords: public-finds, small-finds, recording-archaeology
Presentation Preference: Oral

Summer 2017 marks the 20th anniversary of the Portable Antiquities Scheme (PAS), a project to record archaeological finds discovered by the public. In May 1998 the PAS had its first digital database for recording these finds; this was completely re-developed following the expansion of the PAS to the whole of England and Wales in 2003. To date almost 1,250,000 archaeological objects have been recorded by the Scheme, which not only make these finds publicly accessible, but provides an important academic resource for archaeologists and other researchers. With the establishment of PAN (Netherlands) and MEDEA (Flanders) PAS is now no longer alone in recording public finds. This offers a unique opportunity for archaeologists interested in recording public finds to share skills and expertise, and also share resources in an age of reduced public spending.

This paper will provide a short introduction to the PAS and its database (finds.org.uk), showing how both have developed over the last 20 years. It will highlight PAS's experiences of recording public finds, particularly how we have adapted to encourage finders themselves to follow best archaeological practice, and start to use the PAS database for recording their own finds (following training and with support). It will also look to the challenges of the future, as digital technology changes and budgets to react to public expectations of online technology are squeezed.

05 PAN (PORTABLE ANTIQUITIES OF THE NETHERLANDS): AIMS AND PRINCIPLES

Author: Professor Dr Roymans, Nico - Vrije Universiteit Amsterdam (Presenting author)
Keywords: Portable Antiquities Netherlands
Presentation Preference: Oral

In 2016 the Netherlands Organisation for Scientific Research granted us the project Portable Antiquities in the Netherlands (PAN). The project was launched at Vrije Universiteit Amsterdam in September 2016 and will run until 2020. In my paper I will introduce PAN by explaining its ambitions, basic principles, its organization, as well as its long-term vision.
The PAN project is aimed at the documentation and publication of collections of artefacts in the Netherlands, gathered by members of the public, most of which using a metal detector as a leisure activity on arable fields. By publishing finds online, the objects are made available for heritage purposes, for academic research, and for members of the general public to enjoy. The scientific potential of these collections is enormous, but so far the finds have not been systematically documented. Our project links up with the renewed (2016) Heritage Act in the Netherlands which legalizes metal detection by hobby archaeologists on the condition (among others) that finds are reported.
PAN has explicitly chosen for an open network approach, based on close cooperation with a wide range of partners. PAN employs a team of 7 Finds Liaison Officers and 3 Finds Specialists for the registration of finds. In the near future, volunteers will be trained to assist with the documentation work. By intensively cooperating with hobby archaeologists and by the online publication of finds, PAN fits in with current ideas on democratisation of archaeological heritage and crowdsourcing.
At the end of the NWO project in 2020, the PAN digital infrastructure will be taken over by the Dutch Heritage Agency, in this way guaranteeing the continuation of PAN. It is also our aim to invest in international cooperation and contribute to the development of a European digital infrastructure for metal finds.
Website PAN: www.portable-antiquities.nl

06 PAN (PORTABLE ANTIQUITIES OF THE NETHERLANDS) IN PRACTICE

Author: Dr. Heeren, Stijn - Vrije Universiteit Amsterdam (Presenting author)
Keywords: linked-data, reference-collections, outreach
Presentation Preference: Oral

PAN is the registration programme for portable antiquities in the Netherlands, that was launched in 2016. Central topics in this contribution are the strategy for approaching the volunteer world, and the functionality of the PAN-website.

In the short period that PAN is active, the most often heard compliment of the detector community is that they are surprised about how easy it is to contribute. There is a correlation between outreach activities and new detectorists contacting us to declare their finds. This means that outreach a pro-active approach of PAN-personnel helped to achieve cooperation.

The structure of the PAN digital infrastructure will be explained. The website is built on the principle of Linked Open Data and various elements in PAN are also linked to existing thesauri on the internet, using permalinks.
We make a fundamental distinction between the objects we document and their identification. For each object we describe its material, decoration, the measurements, and so on. For object identifications, PAN employs digital reference types, which allows us to describe identical objects in exactly the same way. An object type, its archaeological date, literature reference, an ideal picture, etc, need to be entered only once and can then be re-used indefinitely. The visual presentation makes the module of reference types easy to use. This thesaurus of reference types is an innovation not present in other registration systems.
For the near future we aim to apply for a European funding programme in order to advance find registration as well as research on these finds, in a number of Northwest-European countries and regions.

Website PAN: www.portable-antiquities.nl

07 LINKING DISPARATE ARCHAEOLOGICAL FIND DATA REPOSITORIES: THE EXAMPLE OF NOMISMA.ORG

Author: Dr Wigg-Wolf, David - Deutsches Archäologisches Institut (Presenting author)
Keywords: Linked Open Data
Presentation Preference: Oral

The project Nomisma.org was initiated by the American Numismatic Society in 2010. The original aim was to facilitate the online presentation of numismatic concepts employing the methods of the Semantic Web and Linked Open Data. In this way it has laid the foundation for the machine-based exchange of data between systems.
The architecture, vocabulary and ontology of Nomisma.org are now employed for a number of projects that draw together data from various resources, including coin cabinets and inventories of archaeological coin finds in order to exchange data, as well as to publish them online: for example Online Coins of the Roman Empire (OCRE: http://numismatics.org/ocre/) or Coin Hoards of the Roman Republic Online (CHRR: http://numismatics.org/chrr), which also present temporal and spatial distribution visualisations of coin finds from a variety of sources. Other resources that employ the Nomisma.org toolbox include the AFE Metaportal being developed by the Römisch-Germanische Kommission, Frankfurt (http://afe.fundmuenzen.eu/index.php/sparql-endpoint) to access distributed databases via a SPARQL Endpoint.
The use of LOD also facilitates the linking of Nomisma.org, AFE and OCRE/CRRO to various other thesauri, gazetteers and systems such as Getty, Pleiades, Geonames or iDAI Bilbliography and iDAI Gazetteer, thus enriching the data held significantly.
The experience of Nomisma.org provides useful lessons that can applied productively to other archaeological data, including artefacts found by private collectors.

159 TRANSITIONS IN PREHISTORY: INSTANCES AND CONSEQUENCES OF THESE EVENTS RESULTING FROM CLIMATE, MIGRATIONS, NEW TECHNOLOGIES AND OTHER CAUSES.

Theme: 6. Interpreting the archaeological record
Author: Templer, Michael (Switzerland) - Neuchâtel University
Co-Author(s): Polcaro, Andrea (Italy) - Università degli Studi di PerugiaSuderi, Alberto (Italy) - National Vice President of the Italian Archaeological Groups
Keywords: Transitions, migrations, technologies, climate
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Prehistory is punctuated by changes in technologies and lifeways, some of which occur over long periods of time, some more rapidly. The causes can include climate changes (for better or for worse), migrations, exchanges, or the dissemination of new technologies, to mention some of the more obvious. The impact of these changes will have impacted autochthonous populations and incoming migrant in different ways, and deciphering the local to regional to country to continent- wide histories is the challenge of archaeologists, who have at their command - and at a price - a growing panoply of new and maturing technologies, which whilst often slowing the pace of excavations and the subsequent analysis of the data collected, vastly enrich our ability to decipher the events (causes and consequences). No two situations are similar, so that whilst theories and ethnology are useful tools to test the data and look for answers, the end objective must be to write the history and evolution of once-living peoples over time and space.
In this session we will examine specific examples of such Transitions between the Late Palaeolithic and Protohistory as interpreted by archaeologists.

01 FROM THE CAVES TO THE DOLMENS: SHAPING THE LANDSCAPE THROUGH FUNERARY IDEOLOGY, THE TRANSJORDAN HIGHLANDS AT THE END OF PREHISTORY

Author: Dr Polcaro, Andrea - Perugia University (Presenting author)
Keywords: Dolmens, Transjordan
Presentation Preference: Oral

During the transition between Late Chalcolithic and Early Bronze Age I periods (3800-3500 BC), a strong change in the impact of the man on the landscape is attested in the Transjordan Highlands, in particular through megalithic constructions. After this chronological period at the end of Prehistory, the first urban communities emerged in the Southern Levant, appearing in the region in the Early Bronze Age II (around 2900 BC). During the previous Late Chalcolithic Period, to the Jordan River toward the sea costal plain, the typical tombs are natural caves used to bury ossuaries, clay boxes of different shapes containing human bones in secondary position.
After the collapse of the Ghassulian culture, during the two centuries preceding the Early Bronze Age I, dozen of large and small new megalithic necropolis started to be constructed along the east-west tributary rivers flowing toward the Jordan Valley. These new megalithic fields (Jebel al Mutawwaq and Damiye were some of the largest fields), composed by hundreds of dolmens, above ground tombs, changed completely the landscape of Transjordan Highlands forever.
This paper will try to understand the reason of this change and the ideological and economical motivations behind the new megalithic architectonical program of the Early Bronze Age I human communities of the Southern Levant.

02 FROM THE PLAIN TO THE HILL: SHIFTS OF THE SETTLEMENTS IN THE ZARQA REGION (JORDAN) DURING THE 4TH MILLENNIUM BC.

Author: Caselli, Alessandra - La Sapienza University of Rome (Presenting author)
Keywords: Jordan, EBA, Chalcolithic
Presentation Preference: Oral

During the 4th millennium BC a strong climate change occurred in the Southern Levant and in general in the whole of the Near East. The collapse of the Chalcolithic Period (ca. 3800 BC) is marked by a sharp decrease in the number of sites, and Early Bronze Age I settlements (ca. 3600-3000 BC) were characterised by the appearance of new features in architecture and material culture. The discontinuity between the Late Chalcolithic and the Early Bronze Age I can be noticed also in the spatial distribution of the settlements, which is a basic aspect to investigate the socio-economic organization of the Early Bronze I communities. During the shift in the settlement pattern, it is important also to observe the marked regionalisation of the Southern Levant during the 4th millennium, evidenced through the analysis of the different distribution of the sites throughout the different areas. In some regions, settlement patterns show a progressive shift towards the lowlands during the Early Bronze Age. Nevertheless, some Early Bronze Age I sites were established on the top of hills not previously occupied, such as Jebel al-Mutawwaq (along the Wadi az-Zarqa, Jordan). The objective of this paper is to re-investigate the spatial distribution of the 4th Millennium BC sites in the Wadi az-Zarqa basin, in order to identify differences and similarities between this area and the other sub-regions of the Southern Levant during the critical Late Chalcolithic/Early Bronze Age transition.

03 LATE CHALCOLITHIC TO EARLY BRONZE AGE CYPRUS: FROM UNILINEAR TO MULTILINEAR SOCIO-CULTURAL CHANGE

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Keywords: Cyprus transition multilinear
Presentation Preference: Oral

The transition from the Late Chalcolithic to the Early Bronze Age in Cyprus has been a topic of discussion, and often heated debate amongst archaeologists working on the island, since the discovery of the earliest traces of Bronze Age cultural material in the 1940s. The scarcity of evidence for this transition, the absence of a coherent island-wide typology for the Late Chalcolithic wares, the lack of chronological information for many sites dating to and around either side of this transition, and the continued inaccessibility due to the 1974 Turkish invasion of the northern half of the island to the archaeological community, have led to approaches that rely heavily on abstract archaeological theory. In turn, these approaches tend to homogenize the pool of data and mask regional differences embedded in the material culture, while they ignore spatiotemporal differences in the rate and mode of adoption/rejection of technological, social, material and cultural changes. As such, the theoretical models proposed, regarding the causes and course of this transition thus far, are largely unilinear, exclude the possibility of lengthy overlaps between cultural periods, and present the internal and/or external agents of change acting as unified or singular socio-political entities. Contrary to current approaches, this study having completed an in-depth re-examination and where necessary re-study of the totality of available data (bibliographic, chronometric, spatial and pottery data), wishes to break from the unilinear tradition and attempt to outline a divergent multilinear explanatory model, where change occurs or is effected at varying speeds, in which regions and perhaps individual sites emerge as the primary actors of change, and where the external versus internal agents of change debate is replaced by a complex web of dynamically interacting population groups.

04 AN AGE OF TRANSITION: CERAMIC INNOVATIONS AND SOCIAL CHANGES IN THE MIRABELLO GULF DURING THE MIDDLE MINOAN PERIOD

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Keywords: Minoan, transition, ceramics
Presentation Preference: Oral

This paper offers new insights regarding the major changes that took place in the Mirabello Gulf in East Crete during the Middle Minoan Period (ca. 1900-1700 BCE). The most significant change is the transformation of society from localized chiefdoms to states for the first time in Greek prehistory, and the archaeological finds from the Mirabello area depict that change. Specifically, the newly examined material from the site of Mochlos supports the understanding of this transformation. The excavated evidence is discussed alongside other known factors that also contributed to that development: the population increase and the introduction of the potters' wheel.

Five surveys have been conducted in the Mirabello Gulf, indicating the growth of older settlements and the appearance of new sites in the hinterland. This increase in density may have been the product of interregional migration, resulting in a state-level society. The material culture demonstrates common cultural, economic, and social bonds between sites at a regional level. An important technological innovation participating in this transformation at the beginning of the MM IIA period is the introduction of the potters' wheel. Mochlos material conveys how the wheel affected change in the Mirabello area from the end of MM IB to the end of MM IIB. The introduction of new standardized ceramic shapes, either local or imported, depicts common production and consumption habits in a unified socio-cultural regional environment.

Considering the new evidence from the perspective of transitions, this paper discusses the Mochlos ceramic material as it relates to other changes taking place in the Mirabello region during this period. It also gives a glimpse of how this transition affected the cultural and economic life of the settlement and offers new insights on how an every-day object can enrich the model of a new state level society.

05 THE GREAT TRANSITION – FROM PREDATOR TO EXPLOITER

Author: Dr Templer, Michael - Neuchâtel University (Presenting author)
Keywords: Mesolithic, Neolithic, Transition
Presentation Preference: Oral

The most momentous change in the human condition occurred when mankind transitioned from being a Mesolithic hunter-gatherer living in symbiosis with nature to becoming a Neolithic agro-pastoralist able to control his environment. This Transition facilitated the demographic and technological growth with all the consequences of which we are witnesses. In this paper I will briefly outline the archaeological evidence for this Transition in South-East Europe between 9000-4500 BC.

06 FLINT ASSEMBLAGES IN THE CONTEXT OF CULTURAL TRANSITION DURING VI MILL. BC: A CASE STUDY FROM BULGARIA

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Keywords: Neolithic, flint assemblages
Presentation Preference: Oral

One of the most distinctive features of the Early Neolithic flint assemblages from Bulgaria is their raw material. The so-called formal toolkits (sickle blades and various retouched blades removed by punch technique) are made of yellow-honey coloured, waxy, white spotted high quality flint referred to in the literature as '(Pre-) Balkan platform flint', or simply 'Balkan flint' (BF). BF outcrops have been located in Upper Cretaceous chalky limestones of the Pleven-Nikopol region. From there this raw material was distributed in different directions and over considerable distances. The Balkan flint distribution system was one of two major lithic exchange networks operating in Southeast Europe during the Early Neolithic. Its distribution in the context of the Neolithic oikumenae decreases significantly in the second half of the VI mill. BC. During the Late Neolithic BF artefacts remain as a reminiscent cultural element at many of the settlements that show continuous development from the Early Neolithic. At many other sites, lower quality local flint materials from secondary placer deposits are more frequent than BF. Technologically, microlithisation of the flint industries occurs, leading to a change in typological repertoire. This gradual shift in raw material procurement and distribution strategy, techno-typological and functional characteristics of the flint assemblages corresponds to the global changes that occurred during the Middle and Late Neolithic. The palaeoenvironmental basis of these changes has still to be proved; their social dimensions are equally unclear.

07 A POSSIBLE SOLAR CALENDAR FROM THE SICILIAN COPPER AGE-EARLY BRONZE AGE

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Keywords: Eneolithic Sicily Calendar
Presentation Preference: Oral

A number of astonishing monuments, triangular slabs of stone pierced in the center by a large, manifestly artificial hole, have been discovered in Sicily.
The first one is located at the site on Monte Arcivocalotto (Belice River Valley), known for the presence of sherds dating from the Copper Age to the Bronze Age. This megalith is oriented toward the sunrise of the winter solstice.
A second pierced rock is located about 8 km from Monte Arcivocalotto, on the top of a hill, significantly named Cozzo Perciata ("The hill of the pierced one"). It partially collapsed in very recent time, as a result of alightning strike. However, it was quite similar to the one from the region of Monte Arcivocalotto, as is confirmed by a picture taken in the late 1960s. The axis of Its hole pointed precisely in the direction of sunriseat the summer solstice in 2000 BC, over the local geographical horizon. This second pierced rock was named "The stone where the sun rises", since, until a few decades ago, the rise of the sun inside the hole of this rock was the signal for the beginning of harvesting time. In the vicinity of this second rock, sherds dating from the Copper Age and Early Bronze age have also been found.
A third very similar monument has been recently discovered near Gela, a short distance from Castelluccio, the eponymous site of the "Castellucciana" Copper Age-Early Bronze culture. It is oriented to the winter solstice sunrise.
We analyse here the intentionality of the orientations of these monuments, reaching the conclusion that they were purposely astronomically oriented for cultic and calendar reasons at the transition between the Copper Age and Early Bronze Age..

08 REFLEXIONS ON THE EARLY TO LATE MESOLITHIC TRANSITION BASED ON THE CUZOUL DE GRAMAT SITE (SOUTH-WEST OF FRANCE).

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Co-Author: Prof Valdeyron, Nicolas - University of Toulouse 2 Jean-Jaurès, TRACES UMR5608; PhD. Student Sam, Bori - University of Toulouse 2 Jean-Jaurès, TRACES UMR5608
Keywords: Mesolithic, Transition, Lithic
Presentation Preference: Oral

At the turn of the 7th millennium cal BC the European Mesolithic underwent a major break in its technical traditions. This break is marked by a complete renewal of the lithic industries, with the disappearance of the production of bladelets obtained by direct percussion, used for the shaping of narrow armatures, and the appearance of standardised blade production, obtained by indirect percussion or pressure used for the manufacture of trapezoidal armatures or notched blades. This break allows for a clear distinction between Early and Late Mesolithic, which was observed many years back, being described by Coulonges in 1935 based on the Martinet and Roc Allan sites (Sauveterre-la-Lémance, Lot-et-Garonne, France), and by Lacam in 1944 at the site of Cuzoul (Gramat, Lot, France); C. Barrière examined this question in a PhD thesis on the "Tardenoisien" in 1956; J.G.D. Clark theorized the break at the European level in 1958, and S.K. Kozlowski associated Early and Late Mesolithic with the "S" and "K" components of his theory of intercultural currents in 1976.

Since the reports published by Coulonges and Lacam, the question of the fundamental nature of the replacement process was raised. Two hypotheses are in opposition. The first one was formulated by Coulonges, who believed in a clear break with the likely population replacement. To the contrary, Lacam perceived the change as occurring in continuity identifying two archaeological layers presenting a mixed lithic industry which appeared to demonstrate a transitional phenomenon between the two lithic traditions.

Recent work has been undertaken on this question, including collective works in collaborative programs. We can now take a fresh look at this key moment of the European Mesolithic. In this presentation, the "Cuzoul de Gramat" site (where excavations have been resumed since 2005 by N. Valdeyron) will be mainly solicited to question this transition.

09 THE CHALCOLITHIC–BRONZE AGE TRANSITION IN SOUTHERN IBERIA UNDER THE INFLUENCE OF THE 4.2 KYR EVENT (?)

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Keywords: Iberia, Population, BronzeAge
Presentation Preference: Oral

Within the F1 project of the CRC 1266 'Scales of Transformation' we are investigating the transition of societies from a Neolithic/Chalcolithic configuration towards the Bronze Age under the influence of the known climatic 4.2 kyr event. We aim to explore the interrelation between climatic and societal change, and test if and to what extent the climate may have triggered and influenced developments in the human sphere. With this this objective in mind, we seek to quantify cultural as well as population change, attempt to reconstruct the trajectory of the transition and correlate these indicators with the intensity of local climatic change. To achieve this, the project group consists of archaeologists as well as of climatologists, who will deduce local climate change from local (marine) archive and other published sources.

One possible, and maybe most prominent aspect of the social change, could be represented by shifts in population. Demographic studies are currently again an emerging field in archaeology. Among the reasons for this development are the resurrected debate about ethnicity and migration consequent on the advances in aDNA methodology, and the broad application of summed 14C dates as an activity and demographic proxy.

In this paper we would like to present recent results from our research in the Southern Iberian Peninsula, and also discuss the use of 14C dates for the reconstruction of demographic changes. It is however clear that radiocarbon dates cannot stand alone. Their distribution is subject to very different influences that may not be associated with developments in the past, but rather result from different scientific strategies and traditions. To cope with this situation other indicators, such as material culture, have to be explored and compared with environmental data (eg., intensity of land use from pollen data) that can be used to correct and "calibrate" the radiocarbon evidence.

10 ADAPTATION OF TAIGA MIGRANTS AMONG LOCAL FOREST-STEPPE POPULATION IN THE WESTERN PART OF WESTERN SIBERIA.

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Keywords: adaptation, migration, Siberia
Presentation Preference: Poster

Natural and climatic conditions in Western Siberia changed for the worse in the Late Bronze Age: it got cooler, humidity increased. As a consequence, the Northern taiga territories became boggy and unsuitable for life. Hunters and fishermen were forced to migrate to the South along the major rivers: Ob, Irtysh, Ishim and Tobol. The traditions brought by the taiga migrants to the forest-steppe zone of the Western part of Western Siberia were established among the local population in the transition from the Bronze Age to the Iron Age. The first simple fortification structures appeared, due to destabilization of the political situation in the region, as a result of the migrant influx from the North. Archeological cultures became two-component for a short period of time. This fact is clearly exemplified by the materials of the settlements where local and alien traditions combined, first of all it is reflected in the morphology and ornamentation of dishes. As to housing construction, semi-dugouts were replaced almost everywhere by dwellings above ground, which were typical of the taiga population. The Northern migrants also brought their traditional way of economy, with a focus on appropriating types of economy: hunting and fishing, which, in the context of climate change, became dominant for a short period of time due to the crisis of local Late Bronze stake-raising economy.
However, combination of producing and appropriating types of economy with drastic domination of the latter in conditions of the "cattle-breeding" forest-steppe zone made the economy non-viable. By the Early Iron Age, the newcomers and all traditions introduced by them were assimilated, which resulted in formation of new archaeological cultures.

11 FOREST-STEPPE TRANSITIONS AND PEOPLING OF THE LANDSCAPES OF THE MID-VOLGA REGION IN THE 1ST MILLENNIUM AD

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Keywords: geoarchaeology, paleoecology, MWP
Presentation Preference: Oral

In the forest-steppe zone of European Russia, the first millennium AD was a time of major changes in the populations, agricultural technologies, social structure, and settlement patterns. A heart of the forest-steppe zone, the Mid-Volga region underwent a transition from a non-populated, mainly forested landscape of first centuries AD, to a highly deforested agricultural landscape of the Volga Bulgarian state by the 11th century AD. Within several centuries, the landscape was transformed by shifting cultivation, wood and ore extraction, the formation of pastures and road networks. These transformations coincided with the major climatic changes, accelerating the effect of Medieval Warm Period (MWP) on soils and ecosystems. A combination of archaeological, stratigraphic, palynological, phytolith, and pedoanthracological analyses allowed us to reconstruct the following stadial landscapes and land use patterns: 1) the initial colonization of floodplains in the 2nd-4th cent. AD; 2) colonization of river terraces in the forested landscape, dominated by linden forests, by agriculturalists of the Imen'kovo culture; 3) an increase in the proportion of birch, pine and spruce in the forest, and a drastic reduction in the proportion of late-successional species after several cycles of slash-and-burn cultivation; 4) abandonment of the area for two centuries in the 7th cent AD; re-growth of abandoned swiddens and pastures by an early-successional forest; 5) at the beginning of the MWP, an anomalous wind activity caused mass tree uprooting, fuel build-up and fires, promoting the formation of a post-pyrogenic pine-spruce forest; 6) re-colonization of the landscape by a sedentary population of the Volga Bulgarian state, clearing the forest for large settlements and permanent fields, establishment of large-scale road networks and vast pastures. Increased temperatures caused melanization of organic remains in cultivated fields and pastures and the formation of Chernozemic soils in the treeless areas already within the first centuries following the land clearance.

12 MECHANISMS OF TECHNOLOGICAL CHANGE IN THE EARLY- TO MIDDLE MESOLITHIC (C. 8500-8000 CAL. BC) TRANSITION OF NORTHERN EUROPE.

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Keywords: migration, hunter-gatherers, mesolithic
Presentation Preference: Oral

How can we identify long distance migration among highly mobile hunter-gatherers? This paper explores the concept of long distance migration, when dealing with prehistoric mobile hunter-gatherers. Changes in axe technology, i.e. raw material preferences, production methods and techniques, are observed at the Early- to Middle Mesolithic transition (ca. 8,500-8,000 cal. BC) in all regions of Norway. Case studies of assemblages containing discarded axes, modification- and production debris will be the point of departure for discussing the mechanisms instigating the observed introduction of new macro tools. Research into the material culture of North European Mesolithic has unraveled large-scale movements of people, interaction and transmission of technological traditions over vast areas. It is generally agreed that the first colonizers of the Norwegian coastal areas originated from Southern Scandinavia (c. 9,500 cal. BC). Until recently the view has been that the subsequent periods mainly represented a slowly progressing change among local hunter-gatherer groups. However, recent research across national borders in Fennoscandia has prompted new insights into Early- and Middle Mesolithic technology on an inter-regional scale. Significant changes in several aspects of technology at the Early- to Middle Mesolithic transition has been identified. Researchers have attributed these changes to a strong cultural impulse from North East Europe. A central aim of this paper is to contribute to the overall discussion of the mechanisms behind technological change in prehistory, in particular to discuss this in relation to the validity of the concept of migration when dealing with mobile hunter-gatherer groups.

13 MODES OF CHANGE. EXPLORING DEMOGRAPHIC AND TECHNOLOGICAL TRANSITIONS IN MESOLITHIC SOUTHERN NORWAY.

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Keywords: Mesolithic, technology, demography
Presentation Preference: Oral

The central concern of this paper is to explore the factors influencing demographic and technological transitions in Mesolithic Southern Norway (c. 9500-4000 cal. BC). The aim is to contribute with knowledge regarding how prehistoric human cultures and societies were formed and maintained over large time-spans, and how and why they were subject to diversity or transformation. By integrating multiple proxy data such as C14-dates, lithic technology and climate data, we investigate the interrelatedness of the different data sets. We explore to what extent and how they have historical congruence, or whether they evolved independently, promoting different modes of change. Insights generated from different case studies are integrated into macroscale analyses of the major factors structuring human cultural diversity across different temporal contexts in order to gain a more holistic understanding of the evolution of human cultural history during the Mesolithic of Southern Norway.

14 ECONOMIC ARCHAEOLOGY – THE WAY TO UNDERSTAND THE EVOLUTION OF ONCE-LIVING PEOPLE. THE CASE OF THE EASTERN BALTIC REGION

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Keywords: Economic, consumption, production
Presentation Preference: Oral

Although various aspects of the social processes and traditions, chronology and typology of the artefacts have been studied for years, the results are usually not entered into a broader context or correlated with thematically detailed research. For a long time in the Eastern Baltic region's archaeological science, the start of the economic processes was directly associated with the spread of agriculture (neolithisation). This has led to a biased interpretation of the long-term developments and to overlook other changes in society prior to the advent of the Neolithic. However, prior to this seminal event in human evolution, human groups in the region already had permanent settlements, large communities, and well developed and complex social systems. Until recently, research which postulated ideas and theories about the Eastern Baltic Region hunter-gatherer communities as small and primitive, are being challenged. Based on many years of archaeological studies there is little doubt that some economic systems existed prior to the transition.The purpose of this paper is to present results and discuss how scientific theory of the economy enables us to answer questions related to the daily life activities of the prehistoric communities: how did prehistoric communities cope with their quest to meet their economic and production requirements? What type and how many resources were needed for communities to exist? What means did they use to ensure their survival and how did they exploit those means? All of the above is reviewed with the understanding that

all prehistoric economic and social processes are inseparable from the inter-regional social, cultural and economic context, i. e. a broader territorial context encompassing the Eastern part of the Baltic Sea Region.

15 CLIMATE CHANGE OR A NEW "GOD"? THE RESULTS OF ARCHAEOBOTANICAL ANALYSES FROM THE EARLY BRONZE AGE SITES IN POLAND

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Keywords: EBA, archaeobotany, Poland
Presentation Preference: Oral

Every transformation is a result of another action that happened earlier. Regardless of its cause, whether the result of a natural disaster or human activities, it could have resulted in major changes within societies or cultural structures. Some might have involved changes in dietary practices or transformations in economic habits towards e.g. more extensive husbandry or crop production. In some cases new species were introduced into agriculture.
There is a general tendency to interpret a lack of archaeobotanical data at the Early Bronze Age sites in the south-western territory of Poland as a shift within society from farming towards animal husbandry. The people who brought the tradition of bronze production have been thought to have also transmitted different economic traditions. However, new studies can shed light on actual activities undertaken by the Bronze Age settlers. A case-study is three sites dated to the classical phase of the Unetice culture located in South-West Poland. During the excavations, features resembling ditches were uncovered. In two cases (Nowa Cerekiew, Pietrowice Wielkie) they were interpreted as being connected with a defensive function. In the case of Radłowice, the author of the excavation implies an economic (water reservoirs) or pragmatic (land improvement) use. Nevertheless, whether the ditches were of a defensive or practical nature, the sites surrounded by them are considered as having a "special meaning". The assumption was checked against archaeobotanical material taken from the sites with ditches and "regular" settlements. The research included analysis of plant macrofossils: a) extracted from soil samples; b) preserved as daub imprints and c) as impressions on pottery sherds. Comparing all the results could help us better understand the transition between the Neolithic and the Bronze Age.

16 NEW TECHNOLOGIES AND TRANSFORMATIONS IN THE EUROPEAN BRONZE AGE: NAUE II SWORDS AND MOBILE WARRIORS

Author: Dr Suchowska, Paulina - Adam Mickiewicz University in Poznan (Presenting author)
Keywords: European Bronze Age
Presentation Preference: Oral

Europe's history is one of steadily increasing connectivity and interaction between societies, and the European Bronze Age stands out as one of those epochs where products of technological innovation and events of transition are most dramatically visible in the archaeological record.

This paper will show that cross-cultural interaction and mobility between societies in the European Bronze Age were more intense than is commonly acknowledged, and that the Bronze Age must truly be considered a formative epoch of European history. Its central hypothesis is that important historical phenomena, such as the famous raids by the Sea People, the material splendour of the Nordic Bronze Age and the rise and downfall of the Mycenaean city states, can only be understood by examining the strong economic co-dependencies across the continent, from Scandinavia to the Mediterranean.

The guiding question is whether and how it is possible to find common explanation grounds for these formative events, based only on the material evidence and scarce historical sources. The approach taken here is a GIS-based mapping and analysis of a large geographical cross-section of the archaeological evidence. Thanks to denser communication networks, technological innovations diffused rapidly in the Bronze Age, lowering cultural barriers and intensifying trade and exchange. A prime example of this is the diffusion of flange-hilted swords of type Naue II, a pan-European weapons technology that bears witness to profound changes in warfare and society. This paper will connect the diffusion of the novel Naue II technology across Europe with contemporaneous changes in the social fabric of Bronze Age societies and the transitional events visible in the archaeological and historical records.

17 CATASTROPHIC EVENTS AND CULTURAL CHANGE IN HOLOCENE HUNTER-GATHERERS FROM THE HYPERARID ATACAMA COAST, NORTHERN CHILE.

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Keywords: Social change, catastrophe,
Presentation Preference: Oral

The southern Atacama coast in what is today northern Chile presents a hyperarid climate with limited water resources and very low terrestrial productivity. This extreme environment was inhabited by hunting and gathering populations for over 12.000 years until the late 19th Century. Even though continuities in technologies and lifeways of these populations have been usually stressed by archaeologists, a closer look at the archaeological record shows important changes occuring at specific moments, especially in settlement patterns and mobility. Maybe the most dramatic shift occured around 4000 cal BP, when semisedentary agglomerated comunities went back to systems of low demography and high residential mobility, modifying their settlement system and burial patterns without showing changes in technology or subsistence. In this paper we explore this sudden process of transition, and correlate it with the occurrence of catastrophic events of wide spatial scale in the coastal Atacama desert, namely a major tsunamigenic megaeartquake.

18 TRANSITIONS IN ANCIENT FISHING COMMUNITIES, ATACAMA DESERT (CHILE). FISHING TOOLS ON C. CHORUS MUSSEL SHELL (8000 TO 4500 YEARS BP)

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Keywords: Fishing-communities, Atacama-Desert, Fishing-tools
Presentation Preference: Oral

Fishing was a crucial aspect in the lifeway of ancient coastal societies. Along the coast of the Atacama Desert (18° to 30° Lat. South), fishing tools on Choromytilus chorus shells (mussel) appear in archaeological sites along several thousand kilometers. These sites have been defined as part of the "Shell Fishhook Culture" and goes from around 8000 to 4500 years BP.
During the ~4000 years that hooks and sinker hook weights on C. chorus shells were present, archaeological deposits show evidence of increasing specialized maritime economy, semi-sedentary settlement systems, and social complexity. After this time, these fishing tools disappeared from the archaeological record and were replaced by hooks made of cactus spines and animal bones. Among suggested explanations for the end of mussel shell fishing technology are changes in oceanographic conditions less optimal for the reproduction and grow of C. chorus and changes in technological decisions made by coastal societies looking for higher fishing efficiency and/or the targeting of different fish species.
Observed transformations in fishing tools are accompanied by changes in other aspects of the archaeological record. This suggests deeper changes within the societies that inhabited the coast of the Atacama Desert, which were probably linked by circuits of mobility of thousands of kilometers along the coast. The present work will discuss these transformations, contextualizing the presence of mussel shell fishing tools within the transitions experienced by Middle Holocene fishing communities of the Northern Coast of Chile.

19 CAUSES AND CONSEQUENCES OF TRANSITION FROM THE MESOLITHIC TO NEOLITHIC AND ENEOLITHIC IN THE POVOLZHYE

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Keywords: migration, technology, aridisation
Presentation Preference: Poster

Transition from the Mesolithic to the Eneolithic was happening in different ways. There was an evolutionary process in the Lower Povolzhye: ancient pottery appeared within the local Mesolithic culture. Another mechanism was traced in the Middle Povolzhye: the emergence of pottery is associated with the migration of people from Central Asia. The technologies of pottery making in the Lower and Middle Povolzhye differ. Around 6500 calBC these processes were interrupted for 300 years due to climate-related disasters: aridisation was recorded in the Povolzhye. The increase of climate humidity around 6200 calBC enabled to resume the process of neolthization. The effects manifested in lifestyle changes from nomadic hunters to sedentary. The functionality of pottery changed as well: it became a container.
Around 5400 calBC the transition from the Neolithic to the Eneolithic commenced in the Lower Povolzhye. Since that time there was new aridisation. The hunters and fishermen economy experienced a crisis. The pottery making technology, the materials and the tools making technology were changing. The microlite technology was presented. First evidence of productive economy was traced. The causes of the transformation were not in the development of the local Neolithic cultures but in the migration of a new population. Khvalynskaya culture appears on the territory of the steppe Povolzhye around 5000 calBP. It existed there till 4500 calBC. Flint materials prevailed among the stone tools. The technology of reinforced pressing appeared. At the same time the tradition of microlite technology was preserved. Large arrowheads, knives and scrapers were produced. The pottery was round-bottomed. Large necropolis appeared. Copper jewelries of Balkan origin were known. The percentage of domestic animals increased. The Khvalynskaya culture bearers penetrated one thousand kilometers to the north up to the northern borders of the Middle Povolzhye.
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20 TECHNOLOGICAL REVOLUTION IN THE PRZEWORSK CULTURE IN THE YOUNGER ROMAN PERIOD. ANALYSIS OF THE MATERIAL CULTURE FROM THE TRANSITION PERIOD.

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Keywords: Przeworsk Culture
Presentation Preference: Poster

At the turn of second and third centuries A.D. significant cultural change took place in Barbaricum, and more specifically on the territory of the Przeworsk Culture. It is visible in the archaeological material culture. In the Early Roman Period, only slight changes are noticeable in the general overview of the Przeworsk Culture. However, at the end of second and in the early third centuries, a rapid change in the material culture is observed, especially in the pottery production. The subject is still discussed, but it would appear that around the end of second century wheel made pottery was introduced on the territory of the Przeworsk Culture and that subsequently, during first decades of third century, becomes dominant in pottery collections. At the same time, the beginning of substantial inflows of roman imports is evident, both on the settlement sites, where, for example, large numbers of the roman coins have been found, and in the cemeteries, where roman military equipment was buried with the deceased warriors in increasing volumes. What were the causes of these changes? The poster will concentrate on the analysis of a few categories of finds, focussing especially on the pottery, which can provide the insight into the question of how migrations of the period fuelled this rapid cultural change.

160 DO YOU SEE WHAT I SEE? THEORETICAL APPROACHES TO UNDERSTANDING ANCIENT WORLDVIEWS

Theme: 6. Interpreting the archaeological record
Author: Morrison, Wendy (United Kingdom) - University of Oxford
Co-Author(s): Tighe, John (Ireland) - Trinity College, Dublin
Keywords: worldview, theory, prehistory,
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

There are many ways of seeing the world, both at an individual and at a societal level. Whilst our modern political and social environment becomes ever more fractured across left/right orientated worldviews, we begin to think more about how ancient worldviews shaped communities in the past. A worldview — or eine Weltanschauung as Kant put it - is a concept enveloping one's beliefs and impressions which allow one to make sense of the world and to figure out how to act accordingly in it. The definition has been expanded upon over time, and now is generally understood to be a philosophy of life, based upon and incorporating a personal or a social ideology. The Oxford English Dictionary defines worldview as a 'set of fundamental beliefs, values, etc., determining or constituting a comprehensive outlook on the world; a perspective on life.'
How we can see worldview through archaeological assemblages? What theoretical approaches might help us get closer to understanding of how people in the past saw their world, via their expressions of self, in either settlement layout, domestic spatial arrangement, or use or rejection of decoration on artefacts?
This session will bring together a series of papers from a wide geographic and temporal range to explore what frameworks can help us come to grips with this challenging aspect of archaeological interpretation.

01 IF YOU LIKE IT, YOU SHOULD PUT A RING AROUND IT: ENCLOSURES AND ANXIETIES IN IRON AGE SOUTHERN BRITAIN

Author: Dr Morrison, Wendy - University of Oxford (Presenting author)
Keywords: worldview, risk, boundary
Presentation Preference: Oral

The forms of structure which people create are a reflection of multiple factors: the tangible, such as the availability of suitable materials, and the intangible, such a taste, choice, and social conventions. People constructing buildings and enclosures are 'informed by cultural knowledge and they act within cultural constraints' (Wilk 1990:35). What drives these choices? Pressures from environmental, political, or social change may have created anxieties and insecurities amongst the inhabitants of these farmsteads, but how they responded to these pressures may have differed dependent on the worldview of the individuals involved.

02 EXPRESSIVE LINES AND CIRCULAR PRACTICE: ARCHITECTURAL DESIGN IN LATER PREHISTORIC SCOTLAND

Author: Dr Romankiewicz, Tanja - University of Edinburgh (Presenting author)
Keywords: Prehistory Architecture Design
Presentation Preference: Oral

Building on an analysis of Iron Age Art and Design based on objects of Early Celtic Art, this paper wishes to expand the theorems of Design Theory / Gestaltungslehre to architectures contemporary with these objects. Scottish later prehistory is selected as a case study to investigate the phenomenon of circular buildings in a domestic and non-domestic context in contrast to continental European practices at the time. Moving beyond the cosmological interpretations of the 1990s, and influenced by Bradley's "Idea of Order" this paper presents a theoretical exploration of the basic elements in prehistoric architectural design: the line, the centre point, the radiant, the circle, the void.

Analysing spatial arrangements and speculating about three-dimensional volumes the study hopes to shed new light on the underlying architectural concepts that created the houses in the everyday context, but also the unusual, extra-ordinary buildings that seemingly had functions beyond the domestic. By investigating the prehistoric built environment it is hoped to catch glimpses of their understanding of the unbuilt world.

03 CAN WE TRACE ONTOLOGY FROM POSTHOLES? A VIEW FROM SCANDINAVIA'S LATER PREHISTORY

Author: Eriksen, Marianne Hem - McDonald Institute for Archaeological Research, University of Cambridge; Dept. of Archaeology, Conservation and History, University of Oslo (Presenting author)
Keywords: ontology, dwelling, settlement
Presentation Preference: Oral

Through almost three millennia, from the Bronze Age to the Middle Ages, people of Scandinavia generally dwelled in a particular architectural form: the three-aisled longhouse. This spatial conservatism may express a type of memory-work, where the house forged links between ancestors and incumbents, across time and space. The house simultaneously created a framework for habitual movement, everyday practice, and social relations.

Upon excavation, the only traces of dwelling that persist are generally the negative imprints of the architectural elements, e.g. an aggregate of postholes or hearths, often dispersed in an utterly chaotic manner. How can we as archaeologists use such unimpressive material remains – really, not remains at all, but a shadow of something that once existed – to trace worldviews or even ontologies of the past? In line with current theoretical debates, and drawing on the case-study of a specific assemblage of negative imprints after a construction that once was, this paper aims to explore where a perspective of postholes as ontology leads. What happens if we shift our gaze and see postholes themselves not merely as discolourations in the subsoil; but rather as present and persisting traces of lived, intimate spaces? And a prehistoric house, not as a representation of world-view, but as an embodiment of it?

04 ANIMALS IN MESOLITHIC AND NEOLITHIC WORLDVIEWS. POSSIBLE CHALLENGES TO THE DICHOTOMIES.

Author: Dr. Pasaric, Maja - University College Dublin (Presenting author)
Keywords: Mesolithic, Neolithic, worldviews
Presentation Preference: Oral

Cultural processes of domestication are often considered to be associated with significant changes to human-animal relationships, sometimes as a fundamental break from perceiving animals as different kind of persons to seeing them as property. Such notions have influenced different ways of interpreting Mesolithic and Neolithic archaeological assemblages. Often, the interpretations are inclined to be built on generalized statements and non-reflective use of ethnographic analogies. Dichotomies created by the construction of opposing identities of hunter-gatherers and farmers leave little space for investigating possible diversities of worldviews, sets of beliefs and practices that reflect and construct the ways people related with their environments and interacted with animals. By exploring notions about personhood, care for the environment, ownership and other concepts, the paper aims to challenge the contrasting narratives about social relations with animals perceived as friends and persons among hunter-gatherers and those about control and dominance driven attitudes towards domestic animals that have been attributed to farming communities. The paper draws from North European Mesolithic and Ne-

olithic case studies and from the Russian language ethnographic literature about East Siberian hunter-gathering and herding communities for the development of ethnographic comparative frameworks.

05 BIRDS AND BEASTS IN CONTEXT: EUROPEAN CELTIC ART OBJECTS AS EVIDENCE FOR IRON AGE WORLDVIEWS

Author: Dr Chittock, Helen - University of Oxford (Presenting author)
Keywords: European Celtic Art
Presentation Preference: Oral

Celtic Art, a swirling style of decoration found on portable objects such as weapons and jewellery, has often been used as a source of evidence on the worldviews of Iron Age Europeans. This art includes images of ambiguous, twisting animals and of human heads which, in lieu of written texts, have been used to make interpretations about the ways that Iron Age people saw themselves and the world around them (e.g. Armit 2012, Aldhouse-Green 2004), sometimes with the help of Classical and Early Medieval written sources (e.g. Karl 2008). These interpretations have often rested on the significance of animal images in Celtic religion and ceremony (e.g. Aldhouse-Green and Aldhouse-Green 2005) but the increasing acknowledgement that religion in prehistory was not separate from other spheres of activity suggests there is room for a new approach to this material.

This paper will add a new layer of analysis to the use of animal imagery as evidence for Iron Age worldviews, by placing images back into the contexts of the objects they are found on. Considering the functions, rather than the meanings, of images on well-used, everyday objects will allow me to provide evidence for what these powerful images did.

My analysis will be based on the Early Celtic Art in Context (ECAIC) database, which includes objects from across Europe. By examining the appearance of certain animal images on certain types of objects, and the specific ways they were deposited I'll be able to reveal new information on the functions of these images in particular spheres of Iron Age activity.

I will compare evidence from across Europe to add texture and detail to our knowledge of the ways that animal and human images were created and deployed across the whole continent, and the places they may have held in Iron Age worldviews.

06 CHARACTERISTIC OF A CULTURAL-HISTORICAL COMMONALITY WORLDVIEW BASED ON STYLISTIC ANALYSIS OF ITS ART.

Author: Ph.D Viktorovna Zhilina, Natalia - Institute of Archaeology Russian Academy of Sciences (Presenting author)
Co-Author: Ph.D Mikhailovich Zhilin, Alexander - State Historical museum (Moscow)
Keywords: worldview, style, commonality
Presentation Preference: Oral

The "style" category was born for the science in the 18th century, when archaeology and art history were undivided, but subsequently they both formed different traditions of using of this category. The idea of the connection between style, time, and environment (material-technical factors) were affirmed in the 19th century.
Archaeology, operating with serial and mass material, observes different manifestations of style in life, its methods let confirm the selection of stylistic complexes by formalized features of the items. The data of artifacts taking part in live processes let build the bridges between stylistics of items and their role in the cultural-historical commonalities. Style as the unity of formal attributes creates the vivid picture, giving the impression of artistic life of a nation (or detached stratum of population) in a specific period of time.
The controversial moment is to include or not the world-view constituent in the characteristic of a style. According to D. Sarabianov, the commonality of style is divided from the world view. Some authors put forward the pithy or decorative side of the artistic form, characterize styles as symbols of the epochs, compare the ornamentation with the spiritual mythological constituent.
Style guides to the world view of an epoch. The semantic commonality, corresponding to it, can be characterized by the results of stylistic analysis.
For ancient periods without writing, stylistic analysis becomes the exclusive reliable instrument, letting compose the impression of commonality through the lens of material culture and determine the unity on the level of world view.
If an unnamed and writing-less cultural-historical commonality left a distinctive complex of monuments, dated by archaeological methods, there emerges an alluring vastness for awareness of this commonality based on stylistic analysis.

07 HOW TO TELL A STORY WITHOUT WORDS – THE STRUCTURE OF BRONZE AGE METAL ARTEFACTS

Author: PhD Gralak, Tomasz - Uniwersytet Wrocławski (Presenting author)
Keywords: Bronze age, ornament
Presentation Preference: Oral

For preliterate societies the ability to memorise is essential for the survival and preservation of culture. That is the reason why traditional oral texts ware constructed and presented in a very specific way. Several characteristic features were identified: additivity - adding new elements without their ordering (time sequence, hierarchy of importance, etc.), redundancy - this technique consists of multiple repetitions and enables the more complete provision of the information in question. Redundancy is connected with another phenomenon described as, variations on a theme'. The repeated information is presented slightly differently each time.
The question is if the structure of material objects made by illiterate societies is someway similar. These issue will be analysed by studying the composition of metal artefacts (jewellery or weapon) from bronze age in central Europe. It seems that everyday items and ornaments were also constructed of repeating elements. Moreover it is possible to observe various variations. Thus in case of bronze artefacts and traditional oral texts general rules were the same. Clearly such a structure reflects the way of thinking and the world outlook of bronze age societies. Another problem is what kind of stories tells these objects.

08 DO WE SEE WHAT THEY SAW? ANALYSING STYLE AND ITS SOCIAL MEANING IN THE DECORATED CERAMICS OF CASTELLUCCIO (SICILY, EBA)

Author: Dr Copat, Valentina - Sovrintendenza Capitolina ai Beni CulturaliDr Costa, Annalisa - Università di Trento
Co-Author: Dr Piccione, Paola - Sapienza Università, Rome (Presenting author)
Keywords: style, identity, Castelluccio
Presentation Preference: Oral

The subject of ancient worldviews and their tentative reconstruction through archaeological assemblages has become central in the last decades, and has often intertwined with the study of identity issues. In fact, the 'set of fundamental beliefs' and the 'perspective on life' of the members of ancient communities must have included also the way in which, either at an individual and at a societal level (and, within the latter, at smaller and broader scales), they identified and defined themselves against the others.
The stylistic variability of artefacts - especially ceramic production and principally decoration - offers a wide gamma of possibilities for exploring this theme. It is generally acknowledged that decorative variability played an important role as a means for defining, expressing and constructing identities, not just as the reflection of social rules and of the interaction between different individuals/groups/communities, but also as an active vehicle of information allowing the continuous negotiation of personal or social identity.
In tackling the issues of style and identity in ancient communities, the methodological question is now how to take an emic perspective, capable – with the help of ethnographic studies - to bring out the points of view (or, in the case, the worldviews) both of the potters and the users (not necessarily coinciding with each other).
Within the abovementioned theoretical framework, we analyse the painted dark-on-light ceramics falling into the so-called 'culture of Castelluccio', spreading between the end of the 3rd and the first half of the 2nd millennium BC (Early Bronze Age) in the largest part of the central Mediterranean island of Sicily. By considering a large corpus of data, we aim at evaluating the role and weight of such factors as local specificity, geographic contiguity and the dynamics of identification/differentiation between social agents in building and shaping their identities and worldviews.

09 "EVERYDAY LIFE"– A STRUCTURED SOCIAL PRACTICE REFLECTED IN ARCHAEOLOGICAL ASSEMBLAGES

Author: Olsen, Dag Erik - University of Bergen (Presenting author)
Keywords: Habitus, social, structures
Presentation Preference: Oral

The study of ancient worldviews has not received a great deal of focus within Norwegian archaeology in recent years, but subjects such as ideology, self-expression and ethnicity has long been of interest for researchers studying the Mesolithic to the Iron Age. The focus has often been on parts of the material culture that most easily expresses something about past beliefs and outlook on life, such as burial and votive practices and various types of status objects. However, this constitutes only a minor part of the material culture remnants we find, the majority can be interpreted as reflecting "everyday life" and a challenge is to "activate" these assemblages in order to say something about past perspectives on life. In this paper I will focus on different types of settlements from the South-Norwegian Stone Age interpreted as reflecting the "everyday life" of social groups in hunter-gatherer societies. The daily routines performed by individuals or groups can be seen as physical manifestations of structured patterns of behaviour, for example in spatial patterns or landscape-use. This implies that shared, common routines are important in producing and reproducing material culture and thus reflects a structured social practice that can be analysed through the concept of habitus as defined by Pierre Bourdieu. Different hunter-gatherer groups could have had varying behavioural patterns that manifested in differences in material culture, and can also be argued to reflect differences in how one perceived the world and the other people inhabiting it.

10 WRITING, IMAGE AND INDIVIDUALIZATION: A VIEW FROM MINOAN CRETE

Author: (current PhD. Student) RAMIREZ VALIENTE, PAZ - University Complutense of Madrid; University of Nottingham (Presenting author)
Keywords: writing, image, individualization
Presentation Preference: Oral

There have been several attempts through different perspectives trying to understand how past people perceived their world. Archaeologists should try to avoid projecting current self-perception of the world to the communities of the past they are researching. Even though it is obvious that it is completely impossible to solve that problem, there are some interesting approaches scholars can use to get closer to ancient worldviews.
A revolutionary theory proceeds from anthropological studies to compare oral and written communities. Goody and Watt (1996) were the first to propose that in literate societies the differences of social status were reinforced by the use of writing. The authors also suggest that writing is connected with the development of a more individual perception of their life experience. In this sense writing contributes to gain distance from reality and to dominate it through representation. According to Almudena Hernando (2002: 53-63) that is precisely one of the keys to the formation of an individual identity.
Following the theory of writing, it is interesting to apply it to ancient societies which are starting to develop scripture. In order to analyze the impact of writing in the creation of individual identities in past societies, this paper will discuss human depictions on frescoes, figurines and seals of the Bronze Age on Crete at the time of the first introduction of writing on the island. The appearance of detailed human facial features in such representations may be seen as an attempt for individualization in early Minoan communities.
This is a preliminary study but further work is necessary to compare different oral and writing societies from a diverse range of contexts.

11 TIMING IS EVERYTHING: – THE STRUCTURE OF NEOLITHIC-BRONZE AGE CALENDARS IN THE BRITISH ISLES, A THEORETICAL FRAMEWORK

Author: Dr. McVeigh, Thor - NUI Galway (Presenting author)
Keywords: Calendars, Prehistory, Feasting
Presentation Preference: Oral

This paper will present a framework elucidating the fundamentals of Neolithic-Bronze Age calendar structures in the British Isles. This framework is based upon a combination of the structures evident in historic calendars and the 'natural' cyclical processes which would have informed the 'rhythms' of prehistoric life. As elements of calendrical structure will have been closely tied to seasonal changes and the timing of agricultural and economic activities, archaeological evidence for the exploitation of various wild resources, cultivars and domesticates further informs the framework. While the evidence does appear to suggest that changes in calendar structure are likely to have occurred during the later Bronze Age, within the theoretical model presented it will be advanced that the Neolithic-Bronze Age calendars of the British Isles had an overarching 'lunisolar structure', and that two calendars are likely to have been utilized in parallel, one with an economic focus, the other with a more overt ceremonial ('ritual' or religious) function. In this context, the economic and ceremonial importance of calendrically scheduled feasts or festivals, particularly those connected with winter solstice, will be highlighted. Furthermore, in combination with the framework provided, the detailed chronological and regional patterns presented serve as a robust foundation for future analysis of Neolithic-Bronze Age

calendar structures. It will also be argued that more nuanced understandings of such calendar structures are possible through integration of archaeological data-sets connected with symbolic systems. This will for example, be demonstrated for the Neolithic with reference to calendrically significant Irish passage tomb orientations.

12 SEARCHING FOR RELIGIOSITY IN THE VENUE OF RELIGIOUS CEREMONIES: THE CASE OF THE ROMAN SOLDIER

Author: Dziurdzik, Tomasz - Institute of Archaeology, University of Warsaw (Presenting author)
Keywords: religion, worldview, Roman
Presentation Preference: Oral

The aim of the paper is to discuss the extent to which archaeological and spatial analyses of venues of religious ceremonies can be used to gauge the impact of said rituals on their witness/participant. That is, if the reconstruction of the sensory experiences of persons during a religious rite can be used as a tool for investigating their worldview, in particular the attitudes towards religion. This is a particularly ephemeral aspect of past societies, as the religious agency of a non-prominent participant of a ceremony is almost invisible in both material and written sources.

As a case study, the religious ceremonies of the Roman Imperial army will be used. They present a perfect opportunity for such an attempt, as in the case of at least some auxiliary units the ceremonies belonging to the official, Roman state religion were attended by soldiers coming from very different cultural and religious backgrounds. As such, they were present at rites which were unfamiliar to them and would be perceived and experienced mostly on the most basic, sensory level. The analysis is further facilitated by the fact that the ceremonies were held in a rather standardised setting of the military headquarters, which was designed with some consideration of the requirements for the staging of cult ceremonies. The existing research suggests that the military ceremonies, regardless of their strictly religious importance at state level, were at least semi-consciously used to influence the social, political, cultural, and most of all the religious worldview of soldiers. But to what extent can be sure of this influence when we begin to analyse the rather meagre experiences of a rank-and-file soldier? And on a wider scale, can the analysis of a cult venue tell us anything about the religious worldview of those who attend it?

13 THE RELATION BETWEEN MAN AND RIVER DYNAMICS FROM A FLOODING PERSPECTIVE IN THE UPPER RHINE VALLEY

Author: Conijn, Arjan - University of Heidelberg (Presenting author)
Keywords: Man/Nature-relations, Flooding, Geo-archaeology
Presentation Preference: Oral

The aim of the interdisciplinary Ph.D.-project 'Land unter,' which is funded by the Thyssen foundation, is to develop a regional history of floods and flood prevention measures based on archaeological and geomorphological studies on the upper Rhine between Strasbourg/Kehl and Mannheim/Ludwigshafen. Central in this study is the shifting relationship of the riverbed inhabitants with the river Rhine. Although several villages have been situated in the floodable riverbed since at least the 8th century, protective dikes did not appear until the 12th century.
With historical sources and geo-archaeological methods we aim to reconstruct the situation of the meandering river during medieval times. This includes a study on former river arms, but one of the most important questions is whether flooding occurred at all during this period. In order to understand connections between the villagers and river dynamics a combination of LiDAR-data, archival sources and soil samples contribute to dating the construction of early dikes as measures of flood prevention, i.e. as manipulations of nature.
Studying historical dikes and reconstructing its environment during the next summer will provide a valuable insight in medieval life along the Rhine. In addition it is important to consider from which period of time a changing understanding of nature allowed to accept flooding disasters no longer as an expression of the divine will, but rather as a challenge to shape and control nature. Combining the results of geophysical research data with an elaborate literature study on the medieval perception of flooding provides an unique insight in a shifting worldview on the relation between man and their river environment.

14 BACKWATER ECONOMIES? A FOODWAY FRAMEWORK FOR EXAMINING (WETLAND) WORLDVIEWS IN PREHISTORY

Author: Ms. Huisman, Floor - Durham University (Presenting author)
Keywords: Identities, wetlands, environment
Presentation Preference: Oral

One of the major problems we face when trying to study past worldviews is the way in which our own, modern western worldview influences our research, from the questions we ask, to our final interpretations. Within the sub-discipline of wetland archaeology, for instance, we often ask why past communities chose to live in such marginal landscapes. We assume that wetlands were 'special' in some way, either as 'ritual' or 'sacred' places, or as resource rich environments. We assume a particular worldview amongst the wetland communities living there, one focussed on 'the wild', which sets them apart from contemporary, 'domestic' 'dryland' communities. Yet rather than assuming the presence of such opposing worldviews, we should assess to what extent the landscape or environment in which people lived truly affected their worldview and the formation of particular community identities.

This paper will explore how we may be able to do this by considering prehistoric communities' (inter-)relation with the environment through a study of past foodways and environmental change. It will present the preliminary results of my PhD research which examines the use of domestic and wild plant and animals in relation to a changing environment in and around the later prehistoric East Anglian Fens (c. 4000 BC-40 AD). It asks if and when a wetland worldview and accompanying identities came into being as the East Anglian Fens changed from a dryland basin into Britain's largest wetland. Thus, this paper explores a new approach to understanding past worldviews, one that not only considers archaeological data, but attempts to integrate these with environmental data. It is hoped this will allow us to move beyond our modern worldviews and gain a better understanding of past worldviews and the way these shaped communities.

163 IN SITU PRESERVATION AT A TIME OF CHANGING CLIMATE

Theme: 2. The Valletta Convention: the next 25 years
Author: Martens, Vibeke Vandrup (Norway) - NIKU - Norwegian Institute for Cultural Heritage Research
Co-Author(s): McGovern, Thomas (United States) - Hunter College CUNYDawson, Tom (United Kingdom) - University of St Andrews
Keywords: climate change, heritage management strategies
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

MERC
Medieval Europe Research Community

Twenty-five years after the agreement on the Valletta Convention, an evaluation of archaeological and heritage management practice relating to in situ preservation seems relevant, particularly in the light of predicted climate change and its effects on heritage sites. In situ preservation strategies place a large responsibility on present and future generations. Recent research indicates that in situ preservation in some cases may be more an illusion than reality.
If archaeological sites are chosen for in situ preservation, the whole wording of the treaty should be followed. Sites should be monitored to evaluate their current state, safeguarded with physical protection measures or mitigation actions and communicated to both the scientific community and a wider audience. In this way one implements both the Valletta and Faro Conventions.
Climate research has documented changes that have already happened. A global temperature rise of 1°C above average of the pre-industrial world was reached in 2015, leading to potential threats to heritage sites. Projections indicate that associated problems will increase in the future. As sites are threatened, heritage managers must develop new strategies. These can range from techniques to mitigate the effects, to tools that help decide when in situ preservation is no longer a viable option to save a site.
This session invites papers and posters that present views on preservation in situ in relation to the impacts of climate change. Topics include possibilities and limitations, sustainable mitigation strategies, and systems for site evaluation to help decide between in situ or ex situ preservation.

01 SESSION INTRODUCTION

Author: PhD Martens, Vibeke Vandrup - NIKU - Norwegian Institute for Cultural Heritage Research (Presenting author)
Keywords: climate change, heritagemanagement
Presentation Preference: Oral

current climate change accentuates the need for heritage management to be prepared to deal with the effects on cultural heritage. How should we best prepare?

02 STORM: SAFEGUARDING CULTURAL HERITAGE THROUGH TECHNICAL AND ORGANISATIONAL RESOURCES MANAGEMENT

Author: Dr Williamson, Rob - Mellor Archaeological Trust
Co-Author: Mr Thompson, Adam - University of Salford (Presenting author)
Keywords: Archaeology, Climate, Sensing
Presentation Preference: Oral

Climate change is one of the biggest challenges that owners and stakeholders of cultural heritage sites across the world face. Recently, there has been a movement in research which has assessed in situ protection of cultural heritage assets from drivers of change. The STORM project, co-funded by Horizon2020, aims to take recent findings and develop novel models, non-invasive and non-destructive methods for surveying and diagnosis of damage to cultural heritage assets. The project will develop tools for predicting environmental change and relating this to damage of cultural heritage sites. The Mellor Heritage Project is one of five pilot sites in the STORM project. Mellor, in the North-West region of the United Kingdom, is composed of three sites: Shaw Cairn, a Bronze-Age burial site, where finds include: flints, pottery and cremated bones, as well as 100 amber beads; Mellor Hilltop, an Iron-Age ditch which encompassed an Iron-Age settlement; and Mellor Mill, the remains of an industrial Mill which was burnt down in 1892. Weather stations and an array of environmental sensors are being used to monitor weather conditions across the sites. The data collected will show how different materials respond to extreme weather events, which may be augmented by climate change. Terrestrial Laser Scanning, 3d models created with UAV, and photogrammetry techniques will be used to monitor the conditions of structure and materials. Together these data will show how extreme weather conditions will impact on the structures and materials on site. The information gained will enable the project to develop tools and methods to mitigate against extreme weather conditions. These outputs will allow management and actors involved in cultural heritage preservation to implement solutions

03 THE CHERISH (CLIMATE, HERITAGE AND ENVIRONMENTS OF REEFS, ISLANDS AND HEADLANDS) PROJECT

Author: Mr Corns, Anthony - The Discovery Programme (Presenting author)
Co-Author: Mr Shaw, Robert - The Discovery Programme; Mr Devlin, Gary - The Discovery Programme; Dr Driver, Toby - Royal Commission on the Ancient and Historical Monuments of Wales; Ms Barker, Louise - Royal Commission on the Ancient and Historical Monuments of Wales; Dr Davies, Sarah - Department of Geography and Earth Sciences, Aberystwyth University; Mr Cullen, Sean - Geological Survey Ireland; Mr Jordan, Cathal - Geological Survey Ireland
Keywords: Coastal climate marine
Presentation Preference: Oral

Funded by the European Union's Ireland-Wales programme, the CHERISH project (Climate, Heritage and Environments of Reefs, Islands and Headlands) is supporting specialist organisations in Wales and Ireland to employ cutting-edge technologies to analyse coastal and island archaeology and maritime heritage sites, which are most affected by climate change, coastal erosion and rising sea levels.
The reefs, islands and headlands of the Irish Sea have a rich cultural heritage. These are iconic locations in the coastal and maritime culture of both nations are home to a number of designated heritage assets. Yet they remain largely unexplored, inadequately mapped and their environmental context poorly understood. These remote, exposed environ-

ments are at constant risk through exposure to extreme weather and storms, which are predicted to increase in intensity and frequency due to climate change in addition to the predicted rise in sea levels.
This paper outlines the main objectives and methodologies within the project, including:
Increase cross-border knowledge and understanding of the impacts (past, present and near-future) of climate change, storminess and extreme weather events on the cultural heritage of reefs, islands and headlands of the Irish Sea.
Map past environments and model predicted changes over the next 100 years to form the basis for management recommendations for future climate change adaptation
Target data and management knowledge gaps, through the employment of innovative techniques to discover, assess, map and monitor heritage assets on land and beneath the sea.
Survey, sample and date selected heritage assets expected to be impacted by climate change in the next 100 years, on land and under the sea.
Raise awareness about the impacts of climate change on heritage, through the training of the citizen scientist and the creation of exhibition material.
Develop best practice and guidance, making recommendations for coastal recording of cultural heritage and its future adaptation.

04 IN SITU PRESERVATION IN A CHANGING CLIMATE ON THE HISTORIC ENVIRONMENT SCOTLAND ESTATE.

Author: Dr. Davies, Mairi - HES Historic Environment Scotland (Presenting author)
Co-Author: Dr Hyslop, Ewan - HES Historic Environment Scotland
Keywords: adaptation, climate, conservation
Presentation Preference: Oral

As a large public body, Historic Environment Scotland (HES) has duties under the Climate Change (Scotland) Act 2009 that require it to contribute to climate change mitigation and adaptation, and to act sustainably. Ministers have identified HES as a 'Major Player' because it has a large influence/impact on climate change. The UK Climate Change Risk Assessment 2012 identified a range of risks and opportunities that climate change may present. Many of these have the potential to impact on the historic environment. HES is key to the delivery of Climate Ready Scotland: Scottish Climate Change Adaptation Programme.
The Schemes of Delegation from Ministers require us to put in place principles, standards and procedures to ensure that the properties in care (PiCs) are conserved and maintained to a high standard. Our Conservation Principles state that our approach to dealing with climate change will be pragmatic and informed and recognises that understanding these risks and their impacts is a key priority. They commit us to assessing the vulnerability of our assets and considering climate change as one of the criteria in our resource management plans.
These formal obligations are reflected in the actions set out in our Corporate Plan (2016) and our Climate Change Action Plan 2012-2017. An Asset Management Plan for the PiCs has been developed under the Scheme, in which adaptation to the changing climate is central. HES has undertaken a climate change risk assessment in partnership with the British Geological Survey (BGS) and Scottish Environment Protection Agency (SEPA). This is assisting HES in shaping and prioritising on-going conservation and maintenance. Our 336 historic properties of national and international importance can help us advance and demonstrate our current understanding of climate change impacts, as well as develop innovative methods of adapting to future climate change risk.

05 CLIMATE CHANGE IN THE ARCTIC: HERITAGE MANAGEMENT STRATEGIES AT THE ARCHIPELAGO OF SVALBARD

Author: Flyen, Anne-Cathrine - NIKU - Norwegian Institute for Cultural Heritage Research (Presenting author)
Keywords: geohazards, preservation, degradation
Presentation Preference: Oral

The Arctic acts as an early warning system for the entire planet. And it's changing fast. Acording to NASA global warming is causing the entire planet to warm up on average, but the Arctic is warming at a faster-than-average rate. Modelling using scenarios developed for the Arctic Climate Impact Assessment indicates that the annual mean temperature will continue to rise throughout the Arctic. This is bad news for the historic remains at Svalbard. Various degradation parameters already affect the historic structures, and climate change will increase the effects. Coastal erosion, solifluction, high winds, raising temperatures causing the active layer of permafrost, the uppermost ground layer, to be defrosted for a longer period than before, and fungal decay are all decomposing the historic remains.
Cultural heritage at Svalbard are mostly preserved "in situ" and the majority are situated along the shoreline. This makes them extremely vulnerable to coastal erosion, even more as the sea ice in the fjords are rapidly disappearing during wintertime. Making them even more vulnerable to effects from climate change most of the historic structures are wooden and thus exposed to fungal decay. Consequently, there is a substantial need to develop the methods and data that will allow the documentation of natural hazard risk for cultural heritage to be quantified and to be met by sustainable management.
This paper outlines the anticipated effects from climate change on the vulnerable historic sites, and discusses the challenges met by the Governor of Svalbard in protecting international historic remains at this Arctic Archipelago. The protection of Arctic cultural heritage in combination with the climatic changes, the wanted human presence and economic activity at Svalbard is challenging, and call for improved management solutions based on both scientific and local knowledge.

06 MELTING MIDDENS IN GREENLAND

Author: Doctor/Phd McGovern, Thomas - Hunter College and Graduate Center CUNY (Presenting author)
Keywords: Climate Rescue NABO
Presentation Preference: Oral

Climate change is impacting archaeological sites across the globe, but the circumpolar north is seeing some of the most drastic impacts. Rising sea levels, increasing storm impacts, and warming soil temperatures are providing a growing threat to both heritage and science. Soil temperature increases pose a special threat as frozen or seasonally frozen deposits once rich in bone, wood, hair, feathers and ancient DNA are degrading rapidly. In Greenland, fieldwork carried out since 2005 has documented a shocking loss of once outstanding organic preservation: of 97 Norse sites tested only three retain significant preserved organics. The NABO (North Atlantic Biocultural Organization, www.nabohome.org) is mounting a RESPONSE project as a collaboration among Greenlandic, Nordic, UK, US and Canadian scholars and institutions to attempt to build capacity to rescue, document, record, and prioritize endangered sites.

07 SESSION DISCUSSION

Author: Dawson, Tom - School of History, University of St Andrewa (Presenting author)
Keywords: climate change, insitupreservation
Presentation Preference: Oral

discussing the contributions in first half of session and wider perspectives of in situ preservation at a time of changing climate

08 SCOTLAND'S COASTAL HERITAGE AT RISK

Author: Archaeologist Dawson, Tom - University of St Andrews (Presenting author)
Co-Author: Graham, Elinor - SCAPE Trust
Keywords: coastal erosion, community
Presentation Preference: Oral

Ideas on how to preserve archaeological sites threatened by natural processes have evolved in Scotland over many years. Coastal sites are particularly vulnerable to erosion and storm damage, and the World Heritage Site of Skara Brae is a good example, having been uncovered in the mid-nineteenth century during a storm. The traditional way to preserve coastal monuments is by constructing a sea wall, but these are both costly to build and need regular maintenance.
For the past two decades, new ways of working with sites threatened by coastal erosion have been explored by Scottish heritage managers. This has included the training of local community members, who have worked with professionals to locate and monitor vulnerable sites. Many of the recent initiatives at coastal sites have been undertaken as a collaboration between the SCAPE Trust and Historic Environment Scotland, the lead public body for cultural heritage in Scotland. This includes a programme of rapid coastal surveys, initiated in 1996, followed by a project to prioritise action at vulnerable sites. Recognising that things change quickly at the coast, the Scotland's Coastal Heritage at Risk Project has worked with citizen scientists to update information and reassess the prioritised list. In tandem, local communities have proposed projects at locally-valued sites, and SCAPE has facilitated joint projects where local groups and professionals have undertaken a range of different actions. The aim has been to explore alternative ways of recording threatened sites, and projects have ranged from surveys to digital recording; from excavation to site relocation.
This paper will outline the methodologies employed and will discuss the lessons learned from the various approaches taken to the recording of the archaeological heritage of Scotland's eroding coast.

09 MONITORING HERITAGE IN THE COASTAL ZONE OF IRELAND. CASE STUDY: SKELLIG MICHAEL

Author: Mr Corns, Anthony - The Discovery Programme (Presenting author)
Co-Author: Mr Shaw, Robert - The Discovery Programme; Mr Devlin, Gary - The Discovery Programme
Keywords: monument monitoring 3d
Presentation Preference: Poster

The Discovery Programme has been working with the Office of Public Works to develop a monitoring strategy for the built heritage of Skellig Michael World Heritage Site. Elements of the fragile 6th century drystone structures of the monastic sites at both the Monastery and South Peak of the island have shown cause for concern, with visual signs of deterioration and potential structural movement. The aim of the project was to establish a rigorous network of physical control points to enable regular monitoring by total station observations to ascertain the stability of the structures. In conjunction, a parallel assessment of terrestrial laser scanning as a monitoring tool was undertaken, examining the potential of this rapid non-contact technique as an alternative, more flexible option, giving potentially greater levels of information on the nature of any deformation taking place.

This research fits into a wider programme of coastal heritage assessment commencing this year as part of a project called CHERISH – Climate Change and Coastal Heritage. This is five project funded through the EU Ireland Wales Co-operation Programme and aims to increase our understanding of climate, risk and the remote heritage of the Irish Sea zone. Partnering the Discovery Programme in this project are Royal Commission on the Ancient and Historical Monuments of Wales, Geological survey of Ireland and the University of Aberystwyth.

This paper will analyse the outcomes from the Skellig Michael monitoring research and consider how this has helped to inform and shape the research agenda of the wider CHERISH project.

10 HOW TO INCORPORATE CLIMATE CHANGE IN THE ARCHAEOLOGICAL RISK ASSESSMENT

Author: Vorenhout, Michel - IBED, University of Amsterdam; MVH Consult (Presenting author)
Keywords: Burial environment, Monitoring
Presentation Preference: Oral

The risk assessment for an archaeological site is an important tool in management of that site. When it is conducted correctly, the scientific choice for in or ex situ preservation can be made relatively easy. The archaeological risk assessment should include environmental conditions. Those are usually measured during a base line study, or estimated using expert knowledge. Measurements will always show variation. Variation is caused by many factors, ranging from seasonality, year to year variation, longer term variation, local management changes to measurement errors. Climate change has an effect on longer time periods, creating a shift in the actual base line. This presentation discusses options to extract climate change effects from the measurements and shows ways include climate change in an archaeological risk assessment.

11 THE FINE ART OF PRIORITIZING

Author: Mrs Dalen, Elin - Riksantikvaren/Directorate for Cultural Heriatage
Co-Author: Mrs Johansen, Kristine - Riksantikvaren/Directorate for Cultural Heritage (Presenting author)
Keywords: strategies, scientific programs
Presentation Preference: Oral

Climate change is happening as we speak and has huge impact on our lives. It also directly influences the condition of sites and landscapes. Some of them will be destroyed, others will remain unchanged. In situ preservation is not always the answer to the challenge that climate change implies. Excavation, documentation and research is another possibility. This means we must choose between when rescue archaeology by excavation (ex situ) is the answer and when other preservation strategies are preferred. This is a classical dilemma in archaeology, but now we face a more comprehensive threat as we see an increased number of sites being washed away due to flooding, heavy rain or landslides.

In Norway, we develop scientific programs as a basis for prioritizing between sites for excavation, to safeguard or to surrender to wind and weather. If we decide to excavate sites, we want to choose those that will give us new knowledge and not those that will (re)produce results as a verification of what we already know. This will be elaborated in our paper.

12 INTER-DISCIPLINARY APPROACHES TOWARDS PROTECTING IN SITU WETLAND ARCHAEOLOGY IN A CHANGING WORLD

Author: Dr High, Kirsty - University of York (Presenting author)
Co-Author: Dr Penkman, Kirsty - University of York; Mr Panter, Ian - York Archaeological Trust; Dr Williams, Jim - Historic England
Keywords: Preservation, assessment, inter-disciplinary
Presentation Preference: Poster

Although wetland archaeological sites preserve a unique repository of organic artefactual evidence, they also present a particular challenge for preservation in situ. Loss of waterlogging, caused by factors such changes in land use and climate, disrupts the delicate balance of chemical and biological conditions, resulting in the rapid deterioration of materials such as bone and wood. Recent research has demonstrated that this deterioration can proceed within a matter of years, demanding that the decision between preserving in situ or excavating needs to be made quickly.

Whilst the need for rapid decision making is clear, it is also vital that these decisions are based on the maximum evidence available, incorporating an appropriate assessment of both the condition of the material present and any potential threats to the site. Each decision must also build upon the wealth of knowledge gained from the 25 years of research into preservation in situ conducted since the advent of the Valletta Treaty, including data acquired from case study sites.

As methods of assessing both the geochemical environment and the condition of in situ archaeological material improve, the quality of this understanding is also continually improving. However, the translation of this understanding can prove difficult; researchers need to adapt to the time and financial limitations imposed upon decision makers, and the heritage community needs to effectively identify and communicate gaps in the knowledge base.

As wetland archaeological sites become increasingly threatened by environmental changes, overcoming these communication barriers are critical to addressing the need for faster and better standardised decision processes required. Here, we discuss how bringing together research scientists, archaeological practitioners and heritage management professionals can lead to the development of evaluation procedures that embed the latest scientific knowledge into working practises.

13 MITIGATING CLIMATE CHANGE IMPACTS ON HERITAGE SITES?

Author: PhD Vandrup Martens, Vibeke - NIKU - Norwegian Institute for Cultural Heritage Research (Presenting author)
Keywords: Mitigation, management, climatechange
Presentation Preference: Oral

In situ preservation of heritage sites as advocated in the Valletta Treaty 25 years ago is a challenge to modern heritage management, particularly in the light of climate change. This paper focuses on possibilities for sustainable mitigating actions. To achieve that, heritage management strategies should involve scientific potential evaluation of sites and threat evaluations. Mitigation actions should be fairly easy to carry out, be distinguishable from the archaeology they are meant to protect, and preferably not cost a fortune. How may this be achieved and applied at threatened sites? A few examples from Norway are presented and discussed.

14 CLOSING REMARKS, SESSION DISCUSSION

Author: Profesor McGovern, Tom - Zooarchaeology Laboratory Anthropology Dept. Hunter College CUNY (Presenting author)
Keywords: the way forward
Presentation Preference: Oral

Final discussion of session, summing up the presented papers and the way forward

164 ARCHAEOLOGY WITHOUT BORDERS: FREEDOM OF THINKING, FREEDOM OF MOVEMENT – A JOINT EAA-CIFA ROUND TABLE AND DISCUSSION

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author: Wait, Gerry (United Kingdom) - Nexus Heritage/CIfA; Chartered Institute for Archaeologists
Co-Author(s): Almansa, Jaime (Spain) - JAS ArqueologíaFernandez-Gotz, Manuel (Spain) - EAA Board; University of EdinburghHueglin, Sophie (Switzerland) - UNESCO World Heritage Claustra Son Jon
Keywords: Professionalism, freedom of movement,
Presentation Preference: Round table

The rise of social movements in many European countries involves a rise of nationalism and a loss of interest in cooperating across national boundaries. The potential is a breaking down of the 'liberal ideals' of Europe which have done much to foster the EAA and other archaeological organisations to grow and flourish. For a generation, archaeological ideas and archaeologists have flowed freely across Europe. Major infrastructure projects have benefitted from the involvement of experts from many countries, and most academic departments have been enriched by the presence of visiting scholars and EU funded research projects.
Will the rise of nationalist/isolationist parties and movements change this freedom of movement of ideas and people? And if so, how?
Should archaeological organisations respond? And if so, how and what should they do? What role do professional and membership organisations have in this situation: while avoiding overt politicisation this is a social landscape that archaeologists may not feel equipped to walk into!.
EAA and CIfA are jointly considering these issues and invite a set of papers to discuss various aspects of the status quo and the implications. This will be followed by an open discussion by all participants about what can and should be done by the leading European archaeological organisations, from which both EAA and CIfA can best support the profession and archaeologists.

01 FREEDOM TO MOVE

Author: Mr Hinton, Peter - Chartered Institute for Archaeologists (Presenting author)
Keywords: Freedom, ethics, profession
Presentation Preference: Oral

Decisions about the exercise and restriction of freedoms should be governed by ethical principles. So should professionalism. What should the roles of a professional institute and membership association be, when governments and institutions choose to impose restrictions on our freedom to practise archaeology – not on the basis of our ethical behaviour or our abilities, but on the basis of nationality? What are our rights? What are our responsibilities?

165 BURIALS AS COMPLEX FEATURES: EXPLORING NEW APPROACHES TO DEATH AND BURIAL IN ARCHAEOLOGY

Theme: 6. Interpreting the archaeological record
Author: Fahlander, Fredrik (Sweden) - Stockholm University
Co-Author(s): Klevnäs, Alison (Sweden) - Stockholm UniversityRebay-Salisbury, Katharina (Austria) - Institut für Orientalische und Europäische Archäologie
Keywords: burials, materiality, assemblage, science, theory
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Archaeologies of death and burial have undergone several theoretical and methodological developments in recent decades which question traditional ways of perceiving graves as closed contexts and the dead in terms of static social identities. Graves are now commonly recognised as complex features which may comprise several phases and post-burial actions. They are also increasingly understood as partial glimpses into wider mortuary and commemorative practices rather than their culmination. From a relational perspective of 'becomings', the way a grave presents itself as an assemblage can expand the context over time and space by stressing life-histories and trajectories of both bodies and materials. Such approaches in combination with isotopic and biomolecular information enable us to discuss the dead as corporeal, intersectional life-histories beyond general properties such as sex, age and status. Symmetrical and posthuman approaches have also criticised the elevated status accorded to human remains and emphasised the significance of animal and other materialities in burials.

Contemporary archaeology extracts more and new types of information from both bodies and graves in terms of wood and soil analyses, archaeobotany, spectrometry, ceramic analyses of clay and heat, aDNA, isotopes and osteology. These developments underscore the need to discuss and reconsider techniques, methods and documentation employed when excavating graves. How do new types of information gained from burials relate to current theoretical strands and methodological concerns? We welcome papers elaborating on methodological, practical and theoretical approaches that recognise the complexity of death and burial with new (and old) tools and thoughts

01 GRAVE CONTEXTS AND CONTEXTS OF GRAVES

Author: Dr Rebay-Salisbury, Katharina - Austrian Academy of Sciences (Presenting author)
Co-Author: Dr Salisbury, Roderick B. - Austrian Academy of Sciences; University of Vienna
Keywords: context, graves, interpretation
Presentation Preference: Oral

Archaeologists frequently talk about grave contexts without clearly defining what context refers to. This paper intends to clarify how we get from the archaeological context that we study to the systemic context we are interested in, via the interpretational context that includes our research agendas, biases and philosophical standpoints. Ideas about what a 'standard burial' entails, as well as what we expect or want to find, shape what we uncover in graves. But can we do better? In this paper, we will use several examples from our 'Motherhood in Prehistory' project, which investigates grave contexts from the early Bronze Age to the late Iron Age, to illustrate how thinking about the temporal, environmental and seasonal context of burials may give us additional insights into the past. Our aim is to develop an interpretational framework for thinking about context that aids future research in burial archaeology.

02 THE DEATH AND RESURRECTION OF BURIALS

Author: Dr Anthony, Sian - Lund University (Presenting author)
Keywords: Burial, stratigraphy, cemetery
Presentation Preference: Oral

Modern cemeteries are composed of multiple burials within congested areas where the new burials inserted reorganise the old. The space below-ground becomes a three-dimensional puzzle where gravediggers introduce new relationships and intersections.
The lowering of the coffin into the ground is commonly perceived to be the end point of its biographical life. However burials remain active as their materiality is continually shaped and recycled. Everything is reused; grave cuts are followed for new burials and soil transferred between graves. Old coffin wood is used for shoring or to mark graves. The burial unit, which took so long to assemble above-ground, is reduced.
It takes time and deliberate actions to de-construct a burial and reduce its components to individual items. Within a complex intersecting cluster of burials a gravedigger constructs new identities from old, merging some burials and reducing others. Their conception of a burial is shaped by the passing of time and their repetitive actions built through tacit knowledge of managing cemetery space. The burials become something more malleable and it is how this process is conducted that throws light on the concept of a burial and how it dies and is then resurrected in a continual process within a cemetery.
I argue for a closer examination of the disuse phase of burials and question if there really is one. Flexible groupings of contexts may be more useful in explaining the importance of the biographical trajectory of a burial, or of many flexible burials. Interpretation and understanding can be found instead in the interfaces and movements between burial contexts. Rather than fitting a clear and linear sequence, a cluster of burials can be seen as integrated, recyclable and governed more by gravediggers in their long afterlife than in the original intentions of the people who paid and organised the burial.

03 LOOKING THROUGH THE ARCHIVES OF BURIED LIVES. A MULTITEMPORAL DIALOGUE WITH THE DEAD.

Author: Dr. Nilsson Stutz, Liv - Emory University (Presenting author)
Co-Author: Dr Peyroteo Stjerna, Rita - Uppsala University; Dr Torv, Mari - University of Tartu
Keywords: archaeothanatology, archives
Presentation Preference: Oral

Archaeologists interact with mortuary assemblages in a range of different contexts. We tend to focus on the initial excavation as the prime moment for archaeological data collection and interpretation, but we all know that a significant part of the process takes place much later, in the post excavation phase, or even, as will be explored in this paper, as subsequent generations of archaeologists return to older excavation records with new methods and new questions. In this paper we want to explore the archaeological excavation and data collection as one of many taphonomic factors affecting a burial, and expand "the becoming of the grave", and its life history into the contemporary processes of excavation and interpretation. The paper builds on our shared experiences of working with archives of old excavations from Sweden, Denmark, Estonia and Portugal, applying the methods of archaeothanatology to reconstruct complex histories of mortuary practices in the past. Through careful dialogue with the records – consisting of photos, drawings, field notes and even parafinated skeletons, we have revealed details in the prehistoric mortuary practices, but also interacted with the materialized remains of our colleagues' fieldwork. This paper aims to show that with careful attention to the details in this documentation, archival research really can reveal previously unknown information about past practices of interactions with the dead – but also that the attention to archival work expands the biography of the prehistoric dead into a contemporary moment where we can also reflect on archaeology as cultural practice.

04 WONDERS FROM SCRATCH: AN INTEGRATED APPROACH TO MORTUARY PRACTICES AT RIBE'S OLDEST CEMETERY

Author: Dr Croix, Sarah - Aarhus University (Presenting author)
Keywords: Ritual process
Presentation Preference: Oral

A number of recent studies have seen pre-Christian burials in Scandinavia as complex archaeological features, highlighting the multiple acts that marked the involvement of the living with the dead. This complexity is most eloquent at the burial grounds of the Viking-age emporia, such as Birka, Hedeby and Kaupang, where it is often explained as a result of specific social, economic and cultural conditions. The recent investigations at Ribe's oldest cemetery allow adding the site to the Viking-age urban mortuary landscape, but also to approach the emporia's burial grounds for their mortuary significance rather than as mere by-products of urbanism. The archaeological remains from Ribe's oldest cemetery were highly fragmentary, both because of unforgiving preservation conditions and as a result of the practices that led to their deposition. Besides the "traditional" archaeological analysis of burial practices, a range of different methods was applied: osteology (human and animal); strontium isotopes analysis; C14 dating; anthracology; computed tomography; XRF. As a trial experiment, a few samples for aDNA and protein analysis of dental calculus have been taken as well. In this paper, I will address how the integrated approach enabled much more detailed results than the challenging character of the material originally predicted, allowing insights into the chain of actions the mourners undertook to deal with the materiality of the corpse and the involvement of animals and things. This approach also calls for a refined understanding of "burial customs" as schematic categories, which have appeared so inadequate when trying to assess the cultural heterogeneity of the urban communities of the Viking age.

05 LAST THINGS. A NARRATOLOGICAL PERSPECTIVE ON HUMAN-THING ENTANGLEMENTS

Author: Dr. Hofmann, Kerstin P. - Romano-Germanic Commission (RGK), German Archaeological Institute (Presenting author)
Keywords: narratology, funerals, human-thing-relations
Presentation Preference: Oral

In the context of burials, their analysis and their archaeological representations, humans and things are entangled in a variety of different stories. Today, storytelling is no longer seen only as imparting, but also as generating knowledge. When do we use which of the three modes of writing (narrative, descriptive and argumentative) in burial archaeology? Beyond linear biographies, the possibilities of plural narration are to be shown. In my paper I will advocate a consistent relational approach. For this purpose, I will briefly present Wilhelm Schapp's philosophy of histories.

06 UNWANTED GRAVES: A DISCUSSION ON RESEARCH PERSPECTIVES OF THE 'LUSATIAN' URNFIELDS IN POLAND

Author: Dr. Hab. Baron, Justyna - Wrocław University (Presenting author)
Co-Author: PhD. Eng. Garbacz-Klempka, Aldona - AGH University of Science and Technology in Kraków; MA Hałuszko, Agata - University of Wroclaw; PhD Łaciak, Dagmara - Poznań University; PhD. Eng. Miazga, Beata - Wrocław University; MA Nowak, Kamil - Wrocław University; PhD Sady, Agata - Silesian Museum in Katowice; PhD Stolarczyk, Tomasz - Copper Museum in Legnica; PhD Sych, Dawid - Wrocław University
Keywords: urnfields, Poland
Presentation Preference: Oral

Urnfield cultures are commonly associated with hundreds of similar objects occupying considerable parts of museum stores. They were obtained in the course of excavations that were started in the 19th century by non-professional and professional archaeologists and are considered to be the most characteristic site type of Bronze Age Poland. Based on the data collected in early 1960s by T. Malinowski, there are 3,000 (!) archaeological sites where cremation graves dated to the Urnfield period, i.e. from the Middle Bronze Age up to the early Iron Age (in Poland c. 1300-400 BC) have been found. Although new spectacular discoveries have been found recently (mostly as a result of rescue archaeological excavations), urnfields are commonly considered to be one the most boring research areas in prehistoric archaeology. Often they have become 'archaeological rubbish' right after the excavations, as no one expects any scientific value from the recovered material. In the case of urnfields, such an abundance of evidence has apparently become a curse and a striking example of the fact that the quantity of the data does not result in a corresponding increase in knowledge. The urnfields also seem to be resistant to many scientific such as C14 dating or DNA analyses which, in most cases, cannot be applied on the poorly preserved bone remains. What thus can be done with the mass material excavated decades ago, sometimes with missing items or poor quality field documentation? Shall we pretend that these excavations never happened? If so, what is the point of any further excavations? Are urnfields doomed forever? We believe that the neglected cremation graves are complex features and thus require and deserve a wider interdisciplinary discussion using old and new methods, which will provide possible perspectives in the research on urnfields.

07 SEALED FATES: A POSTHUMANIST APPROACH TO HUMAN- AND SEAL DEATHS IN THE CAVE STORA FÖRVAR

Author: Lindström, Tobias - Uppsala University (Presenting author)
Keywords: Gotland, Mesolithic, posthumanism
Presentation Preference: Oral

The cave Stora Förvar on the islet Stora Karlsö, just outside Swedish island Gotland, was excavated during the end of the 1800s and yielded copious amounts of archaeological material, primarily from the Stone Age. Four tons of bones were recovered from the site, mostly from different species of seal. Among these bones were also the scattered remains of approximately nine humans dating to the Mesolithic. Peculiar cut-marks on these bones led to sensationalist claims of prehistoric cannibalism, and even today the humans deposited inside the cave are often interpreted as dangerous or low-status individuals. By reviewing other contexts containing scattered human bones, often mixed with animal bones, and by employing a posthumanist theoretical framework, the author of the following paper seeks to question the earlier interpretations that were firmly lodged in the binary oppositions between animal/human and sacred/profane. It is argued that the dead seals deposited inside the cave were not regarded as mere garbage, but as sentient beings deserving of respect and care. Stora Förvar might instead be considered a venue where hunter and prey, following intimate interaction and shared life-experience, joined each other in a common death.

08 UNILL WE MEET AGAIN... LATE BRONZE AGE CREMATION GRAVES AS A COMPLEX SOURCE OF ARCHAEOLOGICAL INFORMATION

Author: Doc. Hajnalová, Mária - Constantine the Philosopher University Nitra (Presenting author)
Co-Author: Dr. Parma, David - UAPP Brno v.v.i.; Mgr. Bíšková, Jarmila - Masaryk University Brno; MUDr. Kala, Jiří - UAPP Brno v.v.i.
Keywords: large cremation graves
Presentation Preference: Oral

The most common form of the burial rite of the Late Bronze Age period in central Europe is cremation. The cremation remains are, together with other objects, deposited in the shallow grave pits. These graves are later on often disturbed by agricultural activities. The post-depositional processes (disturbance, contamination) and fragmentarity are the main limits for interpretation of this type of archaeological source. Less common is the deposition of cremation remains into large grave-pits matching, with the size and shape, the measurements of unburned human body, which are due to their substantive depth well preserved. When excavated by appropriate techniques, they provide new information about the burial rite and its complexity.
Two sites from Moravia are used to demonstrate how correlation of archaeology, archaeobotany and zooarchaeology allows the reconstruction of the final phases of the burial. It shows that deposition of remains into grave was a series of consequent steps spread over a longer period of time. Detected is the selection and deliberate destruction of objects, the sorting and spatially discrete deposition of burned bones, fuelwood and other burned and unburned objects. The composition of plant macroremains substantially differ in each grave and also in each part of the grave. They allow the reconstruction of the sequence of the deposition, and inform on economic or ideological preferences attributed to the deceased. They also serve as a proxy for the reconstruction of the landscape and the scale of its deforestation.
Cremation burials placed into large grave-pits have in the territory of central Europe a series of common attributes that can be observed and traced through time and space. Their interpretation point rather to the realms of symbolic systems, than to a simple social status of the dead.

This paper has been supported by the CSF14-33170P and VEGA 1/0208/15.

09 PARTIBLE PERSONHOOD: A RELATIONAL APPROACH TO NEOLITHIC MORTUARY RITUAL

Author: Dr Fagan, Anna - University of Melbourne (Presenting author)
Keywords: Personhood, Ontology, Neolithic
Presentation Preference: Oral

The Middle Eastern Neolithic mortuary record reveals on countless instances that the human and animal body was one that was partible, rather than discrete and indivisible, constituted and actively assimilated through exchanges with others, in and out of the grave. The integrity of interments and the identities of 'dividuals were often fractured and dispersed through mortuary customs such as routine defleshing, dismemberment, disarticulation, co-burial, comingling, and curation of body parts. Indeed, the purpose and efficacy of funerary ritual appears to have been predicated on the permanent disruption of the unity of the corpse. The radical fracture of the body and its reorganisation and recombination with other entities and artefacts can be further elucidated through explorations of kinship and personhood in anthropological and ethnographic research. In West-

ern discourse, the body is typically conceived to be autonomous, self-contained, private, asocial, and bounded. However, amongst many Indigenous human groups, personhood is neither discrete or individualised, but rather consists of fluctuating attributes that emerge through dynamic social relations and practices; the physical sharing and exchanging of food and biofluids; and through decoration, modification, and adornment. The body is the primary nexus of personhood, identity, and social relations – a material corollary of the inherently corporeal sociality from which it is produced. Following this line of thought, it might be analytically profitable to conceive of instances of corpse fragmentation and skeletal intermixing in the Neolithic burial record as actualised expressions of the co-productive and consubstantial relational nature that defined membership in these communities.

10 DEPOSITED INFANTS AS ANIMATE OBJECTS IN IRON-AGE SCANDINAVIA

Author: Eriksen, Marianne Hem - McDonald Institute for Archaeological Research, University of Cambridge; Dept. of Archaeology, Conservation and History, University of Oslo (Presenting author)
Keywords: ontology, childhood, affect
Presentation Preference: Oral

This paper seeks to explore children as a distinct ontological category in Scandinavia and other Germanic areas, through a specific mortuary treatment: infant deposition in wetlands and settlements. Throughout the first millennium CE, infants – or parts thereof – were repeatedly deposited in wetlands and settlements. Cause of death is in most cases unknown, although some individuals have convincingly been intentionally killed. The paper takes as its departure that the conceptualization of children is neither universally given nor a marginal aspect of society. The construction of infancy can rather be a significant proxy for how a culture defines crucial ontological ideas, such as social norms and moral, gender, and even humanity.

The paper demonstrates that infant deposition was shared by several Germanic peoples over several centuries. Whether the children were victims of infanticide, human sacrifice, or natural deaths, the depositional practice was intimately connected with specific places – wetlands and the house – and even with certain architectural and spatial elements within the dwelling. Infant deposition thus constituted a distinct tradition across time and space. By drawing on interdisciplinary research on infant loss and infanticide, as well as works from the ontological turn, I aim to explore how the dead bodies of children, as a form of animate objects, were made part of new assemblages, possibly creating specific forms of affect through an atmospheric presence.

11 FOOD FOR THE DECEASED – ANIMAL REMAINS FROM THE CEMETERY IN LENT (NIJMEGEN), THE NETHERLANDS

Author: MA van der Jagt, Inge - Cultural Heritage Agency of the Netherlands (Presenting author)
Keywords: food, burial, Merovingian
Presentation Preference: Poster

Animal remains are frequently encountered in Merovingian graves in northwest Europe. Not only animal companions or objects made of animal bone are found but also food for the deceased. This poster is about the remnants of food found in Merovingian graves in Lent, near Nijmegen, the Netherlands. To distinguish between food and bone debris from earlier periods, criteria where set up. With help of these criteria a large amount of animal remains could be characterized as food. In total there are 29 graves, including nine cremation burials, in which (potentially) remnants of food are found. These remains indicate that the food given to the dead buried in Lent consisted mainly of pork and chicken. This resembles preceding Roman burial traditions more than concurrent Merovingian traditions. An new inventory of Dutch finds shows that the species composition and the amount of unburned food remains found, is unique in the Netherlands.

12 DEAD AND BURIED? PATTERNS OF BONE DEGRADATION AT MICROSCOPIC SCALE REVEAL VARIATION IN NEOLITHIC FUNERARY TREATMENTS IN FALBYGDEN, SOUTHWESTERN SWEDEN

Author: Dr Hollund, Hege - University of Stavanger (Presenting author)
Co-Author: Blank, Malou - University of Gothenburg; Dr. Sjögren, Karl-Göran - University of Gothenburg
Keywords: neolithic bone histotaphonomy
Presentation Preference: Oral

Post-mortem histories, including how past humans treated their dead, can be partially reconstructed by examining skeletal remains thousands of years after death. Histotaphonomy is the study of patterns of degradation in histological thin-sections of bone. The diagenetic characteristics observable at microscopic scale often reflect the earliest taphonomic events, whereas changes in burial environment and other later occurrences can also be recorded, allowing for the reconstruction of a sequence of events. It is this principle that makes histotaphonomy a useful tool in studying diachronic and synchronous variation in burial practices, although as of yet it is relatively rarely applied. The most common degradative pattern for complete buried human bodies is tunneling of the bone by endogenous gut bacteria. The arrest of or absence of bacterial tunneling may thus suggest special funerary treatments like evisceration or other mummification techniques which inhibit bacterial action. This study uses histotaphonomy for investigating burial practices in the Neolithic, comparing diagenetic patterns observed in long bones from 21 individuals from four megalithic tombs in Falbygden, inland of south-western Sweden. This area is known for its high concentration of megalithic tombs and excellent preservation conditions for skeletal material. The histotaphonomic investigation showed that skeletons from the same megalithic tomb displayed up to three different post-mortem histories, suggesting different burial practices. Where radiocarbon dates were available, it seems that these correlate with different time-periods in the Neolithic. The diagenetic pattern in the bone of a Neolithic bog body from the same area provides an interesting comparison to the entombed skeletons. The study illustrates the power and usefulness of using histotaphonomy as an additional tool in deciphering prehistoric burial traditions.

13 THE LIFE CYCLE THEORY IN STUDYING OF HUMAN OSTEOBIOGRAPHY. A CASE FROM THE NEOLITHIC ÇATALHÖYÜK

Author: Ms Harabasz, Katarzyna - UAM Poznań (Presenting author)
Keywords: life cycle, osteobiography
Presentation Preference: Oral

The paper aims to outline foundations of the research model integrating the life cycle theory, as formulated by Sabrina Agrawal, with research methods of human osteobiography, aimed at effectively studying the biography of prehistoric human beings. Different benefits and strengths of this integrated approach, both at theoretical and methodological level, will be scrutinized.

The effectiveness and heuristic potential of this approach will be discussed by applying it to the study of biography of individuals from different stages in their live cycles originating from the Neolithic site of Çatalhöyük in Central Anatolia. In particular, the paper will discuss the results of analysis of the biography of two individuals of 25 and 45 years of age from this settlement, buried in two different locations and in different burial rite. The presented analysis is aimed at showing research potential of the advocated model as well as illustrate a possibility of grasping different dimensions of biological and social life of any individual from the past.

14 THE DEAD AND THEIR POSSESSIONS: THE AGENCY OF THE CADAVER IN EARLY MEDIEVAL EUROPE

Author: Miss Brownlee, Emma - University of Cambridge (Presenting author)
Keywords: Materiality, agency, cadavers
Presentation Preference: Oral

In periods of furnished burial, studies of grave goods dominate discussions of mortuary practice. Past studies have offered a wide variety of different explanations for why people might place objects in the grave with the dead; a provision for an afterlife, a display of status among the living, or a reflection of the identity of the deceased are some of the more commonly proffered explanations. However, many of these explanations separate the grave goods from the rest of the mortuary ritual, and while there is an appreciation of the archaeologically intangible rituals surrounding burial, most studies have failed to integrate the very tangible body with the rest of the funerary evidence.
Using theories of materiality of the body, this paper will suggest an alternative way of understanding grave good deposition. The extent to which the body itself remains an active social agent, as opposed to becoming an object itself, is key to understanding why objects are placed in the grave, and this can be understood by looking at the relationship between the body and the objects deposited.
This paper will focus on changing burial practices in early medieval western Europe as a case study. Between the sixth and eighth centuries AD, objects cease being deposited in graves across western Europe. Various explanations proffered for this include changing religious belief, or changing social structures, but it is clear that this is a gradual process, taking place over a century. This paper will argue that we need to consider not only changing numbers and types of grave goods, but the changing relationship between grave goods and the body during this period. This suggests another potential explanation for the abandonment of furnished burial in this period: a change in how the recently dead body is conceived of in wider society.

15 ANALYSIS OF SECONDARY MORTUARY PRACTICES IN THE EARLY BRONZE AGE INHUMATION BURIALS FROM NORTH-WESTERN HUNGARY

Author: Melis, Eszter - HAS RCH Institute of Archaeology (Presenting author)
Co-Author: Dr. Hajdu, Tamás - Department of Biological Anthropology, Eötvös University
Keywords: grave-manipulation, re-opening
Presentation Preference: Oral

The re-opening of graves and removal of grave goods appear to have been widespread in the Middle Danubian Region during the Early Bronze Age. Among the nearly 150 investigated inhumation burials from North-Western Hungary (e.g. Hegyeshalom, Szakony, Iván, Ménfőcsanak, Zsennye) not only the phenomenon of so-called grave-robbing appears to have been frequent, but in several cases the removal or translocation body parts and re-using of the gravepits have been documented. By the application of statistical methods, this paper is to provide an overview of burial-manipulations in relation to gender, age, and social status of the deceased characterized by Gáta-Wieselburg type grave goods. Traces of bronze patina on the skeletons were investigated in collaboration with physical anthropologist (Tamás Hajdu) that could lead to the more exact estimation of the number of bronze artifacts placed with the burials, and thus the refinement of the assumed social categories.
The re-examination of archive collections and recently excavated burials with special regard to the treatment of the body and post-funerary manipulations of burial depositions could highlight the affiliation, intention and motivations of the "grave-robbers" in the past and could further nuance the legitimacy of the practice. The investigation of post-funerary manipulations has the potential to shed light on the relationship between the Early Bronze Age communities and their deceased "ancestors".

16 HALLSTATT BURIAL CUSTOMS FROM THE ARCHAEOBOTANICAL PERSPECTIVE – NECROPOLIS AT KAPTOL-GRADCI (CROATIA)

Author: Assistant Professor Dr Šoštarić, Renata - University of Zagreb, Faculty of Science
Co-Author: Prof Dr Potrebica, Hrvoje - University of Zagreb, Faculty of Humanities and Social Sciences (Presenting author)
Keywords: Hallstatt, burial, archaeobotanic
Presentation Preference: Oral

The Early Iron Age necropolis of Kaptol-Gradci, near Požega, belongs to the south-eastern periphery of the Hallstatt cultural complex and encompasses a hillfort settlement and necropolis. We are presenting the results of the archaeobotanical analysis of the 15 tumuli of this necropolis and potential pattern which included cereal grains and various fruits as an element of a complex burial ritual.

17 SECRETS STASHED IN DENTAL IMPACTA AND BURIAL SAMPLES: BEST PRACTICES

Author: Dr. Scott Cummings, Linda - PaleoResearch Institute (Presenting author)
Co-Author: Mr. Varney, R. A. - PaleoResearch Institute; Dr. Levin, Martin - Bethesda-Chevy Chase Root Canal Specialists; Dr. Cohen, Joshua - Virginia Commonwealth University; Mr. Lavin, Michael - Jamestown Rediscovery; Ms. May, Jamie - Jamestown Rediscovery; Mr. Givens, David - Jamestown Rediscovery; Ms. Richardson Hartley, Mary Anna - Jamestown Rediscovery
Keywords: dental, burial, starch
Presentation Preference: Oral

The first people to arrival at Jamestown, Virginia in 1607 met difficult circumstances. The first death was recorded approximately two weeks after landing with subsequent deaths to follow at close intervals. Bodies were interred in single, double, and in one case, triple graves. Best practices for sampling burials during excavation include collection of a variety of sediment samples from areas around the bodies. This paper concentrates on best sampling practices to remove sediments from areas associated with the gut and colon to inform concerning diet prior to death. In addition, dietary evidence gleaned from material impacted into an infected root canal of a teen-aged male, who died a mere two weeks after arrival, documents a diet that included both wheat or a similar cereal and maize, the latter probably consumed after his arrival in the colonies. While his name is unknown at present, a facial reconstruction made from the bones adds to a thorough dental study of this abscess and recovery of dietary evidence from a microscopic study of starch, pollen, and other remains from the tooth canal to create a story of this individual. Best practices start in the field and carry into the laboratory to facilitate archaeological interpretation of the lives of individuals.

18 BRONZE AGE CREMATION BURIAL BEYOND THE SHADOW OF THE URN

Author: Mr Kalafatić, Hrvoje - Institute of Archaeology (Presenting author)
Co-Author: Dr. Čavka, Mislav - University hospital Dubrava
Keywords: bronze age, microexcavation
Presentation Preference: Oral

This article presents development and progress in research of Bronze Age cremated burials in the Northern Croatia through the last decades. For a long time, cremation burial research was focused, almost exclusively, on urns and, sometimes on furnishing goods around urn. Fragmented and damaged finds from the backfill of grave were usually only catalogued, without further analysis.
This method was proven inadequate and insufficient, especially since there is a great uniformity of urn types in the Bronze Age communities of northern Croatia, and attempts to conduct in-depth analysis forced the researchers to turn their attention to other finds and details inside the grave and urn.
Different approach to excavation also yielded new information and scientific knowledge. At the site Mačkovac-Crišnjevi urns were excavated together with infill. Systematic use of computed tomography (CT) and the magnetic resonance imaging (MRI) was introduced prior to excavation and opening of every grave urn resulting in a previously unknown insights into the manipulation of cremated bones inside the urns. CT also enabled success in preserving of bronze objects damaged on a funeral pyre.
Using other different methods we gained relevant new information and knowledge. For example, by improving our excavation methodology we noticed an interesting interaction between older and younger burials and the existence of grave marks visible on the surface of cemetery. This research revealed the complexity of life in the Bronze Age communities and open the way for further research.

19 RE-UNITED IN A GRAVE, THE SURPRISING STORY OF THREE INDIVIDUALS BURIED AT A MEROVINGIAN CEMETERY FROM BORGHAREN NEAR MAASTRICHT.

Author: Dr. Panhuysen, Raphaël - ACASA, Amsterdam University, The Netherlands (Presenting author)
Co-Author: Drs. Altena, Eveline - Leiden University Medical Center, The Netherlands; Dr. Lauwerier, Roel - Cultural Heritage Agency, The Netherlands
Keywords: Merovingian Secondary burial
Presentation Preference: Oral

In Borgharen, just north of Maastricht, sections of a Merovingian cemetery were excavated. The site is a listed archaeological monument because of the presence of remains of a Roman villa. Previous excavations in the area had suggested that the Merovingian burials on top of the Roman villa were deteriorating. In order to examine possible threats to the finds and bones in these graves a detailed test excavation was carried out. During this excavation the grave of an adult female was documented. At the foot end of this grave the remains of two children were found. Based on the finds deposited in the grave the burial dates from the 7th century.
The children were circa 4 and 6 years old and their bones were not found in anatomical position, indicating they were later added to the grave. Based on the analysis of DNA samples the child aged 6 was a boy and the child aged 4 was possibly also of male sex. Furthermore the results of the DNA analysis indicate the 6 year old boy was a son of the adult female. Analysis of the archaeological findings, the taphonomy and physical anthropological data allow us to reconstruct a series of events and funerary practices. These indicate that the children were buried at the foot end of the grave after the soft tissue and ligaments of the foot had already decayed. The fact that the bones of the children themselves were not found in anatomical position suggests that they were collected from older burials. Since the woman died between 44 and 53 years it is probable that these children may have died before the adult woman. Most likely the children died during the lifetime of the adult woman and were added to her own grave months or years after her funeral.

20 AN ANTI-VAMPIRE BURIALS INSIDE WALLS OF THE ST. NICOLAUS CHURCH IN GNIEW (POMORSKIE VOIVODESHIP, POLAND)? - LOOKING FOR ANSWERS

Author: Mr Nowak, Marcin - Nicolaus Copernicus University in Toruń (Presenting author)
Keywords: anti-vampire, burial, church
Presentation Preference: Poster

Archaeological research in the St. Nicolaus church in Gniew (Pomorskie voivodeship, Poland) conducted in 2009-2016. Coverage included the interior of the church - both in the chancel and the nave, as well as the area where the churchyard cemetery functioned in the past. During the 8 years of excavation the team of archaeologists and anthropologists

has managed to documented a large number of well-preserved burials allowing for indirect reproduction the course of the last stage of the funeral of priesthood, nobles and ordinary inhabitants of the city.
Following the continuous use of the space under the floors as the burial place for the richest members of society, in the best condition preserved burials of the modern period, from the end of the seventeenth to the early nineteenth century (when burials inside churches were forbidden). From this period comes two burials located in the western part of the central nave of the church, whose layout and equipment may indicate treatments made to prevent against the dead exiting from the grave.
The subject of anti-vampire treatments was raised several times during the discovery of atypical burials and results of the studies are related mainly to medieval finds. Anthropological and archaeological consideration of this complex phenomenon is often supported by written sources and ethnographic data which shows that vampires were present in the consciousness of both the seventeenth and eighteenth century people. The information mention kinds of undertaken activities like decapitation, piercing with nails, face down or outside cemeteries burials. But does the person recognized as a vampire could be buried in the church? Could it prevent him from rising up from the grave? Or maybe his grave equipment protected such circumstance but the property status and family position did not allow to buried him outside the "sanctified land"?

166 AUTOMATION IN ARTEFACT RECOGNITION: PERSPECTIVES AND CHALLENGES IN ARCHAEOLOGICAL PRACTICE

Theme: 6. Interpreting the archaeological record
Author: Wright, Holly (United Kingdom) - University of York
Co-Author(s): Gattiglia, Gabriele (Italy) - University of Pisa
Keywords: Artefacts, automation, interpretation, recognition, practice
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Given that artefacts are of fundamental importance for the dating and interpretation of archaeological contexts, the automatic recognition of artefact types has been one of the 'golden chestnuts' of archaeological computing, dominating computer application papers of the 1970s and 1980s, but development of a practical working system has not been successful. Nonetheless, software and image recognition technology has moved on, and projects like ArchAIDE, DADAISM and GRAVITATE are working towards the (semi-) automatic recognition of artefacts (pottery, metalwork, stone tools, plastic arts, etc.) and the (partial) automation of archaeological workflows.

Artefact recognition is a time consuming activity, and spending time (and money) in repetitive work is not optimal, but automation can help in supporting interpretation with innovative computer-based tools. Artefact recognition calls for complex, specialist skills which are not always available. Automation can facilitate specialist interpretation for generalists, increasing the number of researchers able to devote more time to data analysis, and consequently to greater comprehension and new knowledge in areas such as trade and exchange, supply and production, religious or social affiliation, and so on.

Based on this assumption, we call for papers to foster both theoretical discussion as well as practical solutions, focused on how automatic artefact recognition could:
- meet real user needs, and generate economic benefits;
- produce new interpretations;
- revolutionise archaeologists' habits, behaviours and expectations;
- create societal benefits from cultural heritage, improving access, re-use and exploitation of digital cultural heritage in a sustainable way.

01 "WHAT IS ESSENTIAL, IS INVISIBLE TO THE EYE1" NEAR INFRARED IMAGING AND CHEMOMETRICS FOR CLASSIFICATION OF STONE MATERIALS.

Author: Sciuto, Claudia - Umea University (Presenting author)
Keywords: Hyperspectral, Minerals Classification
Presentation Preference: Oral

Hyperspectral (HSI) Near Infrared imaging could be used in provenance studies as fast non-destructive screening method for characterizing raw materials. Near Infrared (NIR) Imaging is a powerful non–destructive analytical method for mapping chemical variation on a target's surface: the technique is based on superposition of images collected at different wavelengths, in order to create a hypercube in which every pixel correspond to a spectrum in a selected range. Through the application of hyperspectral imaging the spectral information is coupled with a spatial one and the chemical attribute on an object's surface can be browsed in a two dimensional space. For this characteristic hyperspectral images can be explored through multivariate statistics in order to identify targets with similar spectral signatures.
A dataset of lithics from a dwelling site dated to mid-late Mesolithic at Lillsjön, Ångermanland, Sweden was analyzed using a sisuCHEMA pushbroom shortwave infrared hyperspectral imaging system (spectral Imaging Ltd, Oulu, Finland) for acquiring images from 1000 to 2498 nm at intervals of 6-7 nm. The spectral data were centered prior to principal component and the Savitzky-Golay algorithm was applied for noise reduction. 105 objects were selected as training set and divided in categories of quartz, quartzite, slate and flint according to the PCA (principal component analysis) and their spectral features. On the base of these categories it was possible to run a multivariate statistical classification on the entire dataset of the lithic findings. The categories identified and the corresponding predicted fragments were plotted in the 3D GIS allowing the identification of different groups of raw materials on the site area.

1 Antoine de Saint-Exupery, The Little Prince

02 MINING PAPER CATALOGUES: A MULTILINGUAL SOLUTION TO REDUCE VERBOSE FIELDS TO CONSISTENT TERMINOLOGIES

Author: Mr Kußmaul, Felix - University of Cologne (Presenting author)
Co-Author: Dr Evans, Tim - University of York
Keywords: ArchAIDE, text mining
Presentation Preference: Oral

Capturing analogue sources and storing them in digital repositories is one of the most common applications of information science in modern archaeology. This process is even more desirable when applied to historic paper catalogues, which normally contain large levels of information on a myriad of artefact types. Thus their use for categorizing new findings is an essential task for archaeologists.

Such catalogues often contain long textual descriptions of the relevant artefacts. However, although they provide the most suitable kind of data representation for the human reader, a running text is quite impractical for automatized machine processing. In particular, database lookups risk becoming inefficient due to a lack of consistency in terminologies.

This paper introduces a practical and theoretical approach to reducing descriptive catalogue fields to an amount of information that is sufficient for successful data processing, and with multi-lingual support. The method presented is used in the innovative EU-funded project ArchAIDE with the goal of automatic interpretation and documentation of ceramics on excavations. The project outcome will allow the study of archaeological ceramics to be expedited, and the gathered knowledge to be shared online.
The paper will briefly describe the common structure of a paper catalogue considering the example of pottery catalogues used in the ArchAIDE project. The paper will also discuss the multilingual vocabularies established as part of ArchAIDE, and which provide a unified yet neutral structure for concordance between systems. The paper will also discuss the text mining approach for the description fields that will result in a minimized set of key words from the aforementioned vocabulary. The application of the reduction is shown on an example catalogue entry along with a short analysis and conclusion.

03 EXTRACTING GEOMETRIC FEATURES AND 3D REPRESENTATIONS OF POTTERY FROM PAPER CATALOGUES DRAWINGS

Author: Dellepiane, Matteo - ISTI-CNR (Presenting author)
Co-Author: Itkin, Barak - Tel Aviv University; Banterle, Francesco - ISTI-CNR; Wolf, Lior - Tel Aviv University; Callieri, Marco - ISTI-CNR; Dershowitz, Nachum - Tel Aviv University; Scopigno, Roberto - ISTI-CNR
Keywords: 3D, Artefacts recognition
Presentation Preference: Oral

The classification of pottery sherds is a complex procedure. The experts are supported by a set of reference catalogues that are used to assign each sherd to a class.
The paper catalogues provide a structured (while not always coherent) description of each class, that includes also a visual depiction that essentially describes the profiles of the elements of the class, and possibly some examples of the decorations (if available).
One of the goals of the Archaide EU project is to digitize a set of catalogues associated to a few typologies of pottery, so that a coherent digital description of their shape can be used not only for archival purposes, but also to help the development automatic systems that support the archaeologists with their work on-the-field.
We present the first results of a method that automatically analyzes the drawing of a class, digitized from a paper catalogue. The method is able to extract a set of descriptive geometric features (profiles, key-points, scale) and save them in an SVG file with a simple but exhaustive format. The geometric features will be the guiding data for an automatic system, able to extract information from a single image of a sherd, and use it to provide a list of possible candidates for its classification.
Additionally, the extracted features are used to automatically produce a 3D representation of each class. The 3D models are not only a valuable source for the description, study and comparison of the different classes. They will also be used to automatically create a massive amount of "synthetic sherds", that will be used (together with real data) to train and test the classification system.
The proposed approach has been applied on three typologies of pottery, but it aims at being a possible solution for a number of archaeology related artifacts.

04 APPLICATION OF 3D MORPHING ALGORITHMS TO FACILITATE STYLE ATTRIBUTION OF ARCHAEOLOGICAL ARTEFACTS

Author: Dr. Jiménez-Badillo, Diego - Instituto Nacional de Antropología e Historia (INAH. México); Red de Tecnologías Digitales para la Difusión del Patrimonio Cultural (Presenting author)
Co-Author: Dr. Ruíz-Correa, Salvador - Instituto Potosíno de Investigación Científica y Tecnológica (IPICYT); MSc. Canul-Ku, Mario - Centro de Investigación en Matemáticas (CIMAT); Dr. Hasimoto, Rogelio - Centro de Investigación en Matemáticas (CIMAT)
Keywords: 3D shape analysis
Presentation Preference: Oral

Thanks to recent advances in scanning technologies there has been an increase in the number of methods developed for digitizing archaeological artefacts. Many of the resulting 3D models are used for visualization or archiving purposes. Unfortunately, there are still few projects oriented to gain archaeological knowledge from point clouds and triangular meshes.
In this paper we present some results of an ongoing project focused on analyzing the shape of objects, focusing specifically on a new method to analyze variations of styles in archaeological artefacts. Such method is based on a 3D morphing algorithm that analyzes two objects whose shapes represent the canonical extremes of a continuum, that is, two objects that belong to two different "styles" within a cultural tradition. The purpose of the algorithm is taking these two extreme shapes as input in order to extract several 3D virtual models whose shape or "style" lies "in-between" the two extremes. This is useful in situations where archaeologists need to decide to which extreme a real artefact is more similar.
The idea for this project came from the need to rank shape similarities in a collection of archaeological stone masks from Mexico. This includes masks belonging to several well-defined styles, but it also includes many others that cannot be positioned within a specific class because they share features of two or more canonic styles.
These masks were found in the Sacred Precinct of Tenochtitlan, the main ceremonial Aztec complex, located in Mexico City. The schematic features of these objects set them apart from other artifacts with more naturalistic style. This has attracted the attention of many specialists and during the last three decades these items have been the subject of intense debate, mainly because the difficulties for a clear style attribution of each mask.

172 IMAGINED AUTHORITY: ARCHAEOLOGISTS AND THE MYTH OF POWER.

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author: Trelka, Malgorzata (United Kingdom) - PhD Candidate
Co-Author(s): Howard, Sarah (United Kingdom) - PhD candidate Ironbridge International Institute for Cultural Heritage University of Birmingham, UK; Heritage at Risk Archaeologist Historic England, North West regionBeaulieu, Kiara (Canada) - PhD Candidate University of Birmingham, UK Department of Classics, Ancient History and Archaeology
Keywords: Policy, Community, Heritage Managemnt, Authority
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Power, both perceived and real, help define relationships and codes of conduct in both our social and professional lives. There has been a long-held belief that archaeologists hold authority and power as they are often seen as the representatives of government administration and cultural heritage institutions and more generally as guardians of archaeological sites and collections. As a reaction to what Laurajane Smith later characterised as the "authorized heritage discourse" (AHD), archaeologists in the 1980s started to take a more democratic and interactive approach to cultural heritage. The identification and critique of the AHD was pivotal in accelerating changes to the ways in which professionals made archaeology and cultural heritage more representative and, in a sense, "user friendly". This created a tidal wave of interest in a discipline that was once thought of as stuffy, academic and out of reach of the everyday person, but it may also have served to alter professional practise. This session will consider power relationships in archaeology, and ask if archaeologists hold the kind of power, authority and influence we are led to believe they do? For example, how do archaeologists reconcile their roles as representatives of different archaeological communities (e.g. commercial, curatorial, academic, amateur) with their right to also act as members of the public? The session seeks to deconstruct the myth of archaeological authority by reflecting on where we are now as a discipline and how we can constructively move on from the often circular debate over power and control.

01 NEGOTIATING POWER DYNAMICS IN ARCHAEOLOGICAL HERITAGE MANAGEMENT

Author: (current PhD. Student) Howard, Sarah - University of Birmingham (Presenting author)
Keywords: archaeological heritage management
Presentation Preference: Oral

This paper looks at the complex position of archaeologists within the public sector and seeks to examine as well as debunk some myths regarding their inherent power as curators of the past. It asks whether it is possible for archaeologists to reconcile their role making archaeology accessible as a public service, which often requires the negation of power, whilst retaining the professional power to ensure that archaeology is adequately protected. Despite a discourse to the contrary, archaeologists charged with professional responsibility for the past now find themselves in a position of decreasing power, unable to fulfil their traditional role as protectors of the past. Drawing upon examples from England, the dichotomy of archaeologists as both 'powerful' and 'powerless' representatives of the past is examined.

02 OUTSTANDING UNIVERSAL VALUE AND LOCAL COMMUNITIES

Author: Miss Trelka, Malgorzata - University of Birmingham (Presenting author)
Keywords: Communities, power, policy
Presentation Preference: Oral

In the heritage field, historically, communities have been represented with lesser power in both academic and policy discourse. Heritage Studies scholars often perceive heritage professionals as the ultimate power holders who control the way heritage is understood and absorbed by different communities. By this assertion, we rehearse the idea that the preservation system has been forced on different communities and the way they engage with heritage is governed by legal systems. This, of course, does not mean that it is always university-trained professionals who assign values to the places which are significant to them. In practice communities will have different conceptualisations of their heritage and will construct their understandings and meanings of places and things which are important to them. Whose version prevails will depend on how community groups or individuals negotiate their political power. By contrasting two different realms where heritage identification and guardianship takes place: legal frameworks and non-professional interests, this paper will address the power relationship between so called 'professional' and 'nonprofessional' interests in heritage preservation. This case study is based on anthropological fieldwork conducted by the author in the Ironbridge Gorge World Heritage Site.

03 WHAT'S THE PREFERRED IMAGE OF THE PAST?

Author: Dr van den Dries, Monique - Faculty of Archaeology, Leiden University
Co-Author: Drs. Schreurs, Jose - State Agency for Cultural Heritage (Presenting author)
Keywords: governance, stakeholders, selection
Presentation Preference: Oral

In the Netherlands we have the interesting situation that local authorities, often non-experts, decide on archaeological research in the context of development-led archaeology, whereas the selection and designation of scheduled monuments is made by the national government, on the basis of proposals prepared by archaeologists and heritage professionals. Each approach seems to lead to some favoured images of the past. This paper will discuss the effects of the two practices and what happens when other stakeholders become involved in the governance process. The question is which is the better practice, and better for whom?

04 AUTHORITY AND SUBJECT (IN THE ARCHAEOLOGICAL DISCOURSE IN AUSTRIA AND GERMANY)

Author: Professor Dr Karl, Raimund - School of History, Welsh History and Archaeology (Presenting author)
Keywords: law, policy, practice
Presentation Preference: Oral

The primary task of archaeological heritage management is to represent the "public interest" in archaeology. How this is constituted, or how this interest should be determined, has changed significantly over the past 200 years. In the much more hierarchical societies of Austria and Germany of 200 years ago, it was natural that what was deemed to be

the "public interest" was imposed from above: either the emperor dispensed it to his people (or peoples), or the bureaucracy, invested with imperial authority and in possession of "special expertise" , imposed it on its subjects. Yet, with the emergence of democratic systems of governance, societies have become much more egalitarian, and the means by which the "public interest" should be determined has been re-conceptualised: by means of a "public discourse" in which citizens with equal rights must be heard and can represent and advance their own interests.
As this contribution demonstrates, this egalitarian concept has hardly arrived in (Austrian and German) archaeological heritage management as yet: the relationship between what is now scholarly rather than imperial authority and the civic subject is still stuck before the 1848 Revolutions. Due to the complete lack of a public discourse and the specific form of scholarly engagement with archaeological heritage management, the power of (state) archaeologists is not a myth, and their authority not imaginary, but very real. The dire consequence is a near-total lack of public support for archaeological heritage management in both Austria and Germany.

05 DEVELOPMENT OFFERS POWER AND AUTHORITY TO ARCHAEOLOGISTS: DO THEY USE IT?

Author: Ms. Fleming, Arlene - The World Bank (Presenting author)
Keywords: EIA, Archaeological Record
Presentation Preference: Oral

The Environmental Impact Study originated in the United States in 1969 and was disseminated to nations throughout the world during the late 20th century as the Environmental Impact Assessment (EIA). These instruments for conceptualizing and planning infrastructure development projects are now mandated by legislation and regulation in virtually all countries, and are required by international and bilateral grant making and financing institutions. As implemented by governments and contractors, the EIA requires specific attention to the effects of proposed development projects on biophysical, social and cultural heritage features within a project's area of impact.

Archaeology is included under the rubric of cultural heritage, affording archaeologists the opportunity to survey the area to be affected by a project in order to determine the likely presence of archaeological remains, and to excavate as deemed appropriate. Thus, in theory, archaeology is an integral part of the development process throughout the world. There have been some remarkable additions to the archaeological record as a result of the EIA required by development projects. In numerous cases, the work has contributed to public education, local community participation, and increased respect for archaeological practice and research. However, a lack of attention and understanding of the development process by archaeologists has resulted in missed opportunities. How may this situation be improved to realize the rightful place granted to archaeology in the development process?

06 PLAYING TUG O' WAR; METAL DETECTING GROUPS, ARCHAEOLOGISTS AND THE PERCEPTION OF AUTHORITY

Author: Beaulieu, Kiara - University of Birmingham (Presenting author)
Keywords: Archaeology, Metal Detecting
Presentation Preference: Oral

Authority and power help define codes of conduct and societal norms in all facets of daily encounters. Within the discipline of archaeology, power plays heavily into the roles that archaeologists take on while interacting with other scholars, members of the public, and special interest group. Archaeologists may find themselves in a non-authoritative or passive position when interacting with individuals who hypothetical have more knowledge, education or expertise than them. However, archaeologists can also take on an authoritative (or active) position when they are the individuals who has, or is perceived to have, more knowledge, education or expertise in the matter at hand. Although these power positions are fluid and can change throughout meetings and discussions, archaeologists find themselves often on the authoritative side when it comes to meeting with the public as they are often considered more knowledgeable on matters of heritage policy, conservation and excavation.

This paper focuses on the power relationship found between the author and metal detecting groups in Southern Ontario, Canada and how the passive/active role affects how meetings and relationships develop. Although this special interest group is a small demographic in a geographically specific location, the power dynamic discussed reflects many relationships encountered by archaeologists and special interest groups. This paper will demonstrate how these relationships can alter perceived authority, allegiances and expertise and how the perception of power can influence interactions.

07 THE BALANCE OF POWER: WHO SHOULD TELL THE STORIES OF INDUSTRY?

Author: Raine, Joe - Ironbridge International Institute for Cultural Heritage (Presenting author)
Keywords: power, interpretation, industrial
Presentation Preference: Oral

When discussing responses to the AHD Laurajane Smith dismissed the characterisation of labour history museums as 'sanitized titillation or as sops to deindustrialisation' instead viewing them as places used to critically remember the past and vital tools in regional identity.

In many museums of labour history or industrial heritage throughout the UK former miners or foundry workers are empowered to tell their stories and demonstrate skills gained over a lifetime of experience. For a significant number of museums this forms an essential part of their interpretation offer. Unfortunately, the sad truth is that the number of people who experienced the reality of living and working in industries is always in decline and however many of these stories or skills are recorded as oral histories or video demonstrations the power of immediacy is lost.

This raises the difficult issue of who then inherits the power to tell the story of industrial life and work when those who lived it no longer can. There has long been a desire for communities to have a more significant stake in their heritage but for labour history and industrial heritage, the balance of power is shifting inexorably from members of industrial communities to heritage professionals.

This paper aims to explore the shifting balance of power at industrial heritage sites between who is empowered to tell the stories of industry and industrial communities.

08 THE AUTHORITY OF ARCHAEOLOGICAL KNOWLEDGE IN ROMANIA

Author: Dr Niculescu, Gheorghe Alexandru - Institutul de Arheologie \ (Presenting author)
Keywords: research state power
Presentation Preference: Oral

The propensity of archaeologists to adopt positions of authority in matters of cultural heritage is shaped by local common perceptions of what is superior knowledge, by the role of scientific authority in their traditions of research, and by the nature of their articulation with the political establishment. The current attitude of archaeologists towards wider participation in the protection of cultural heritage in Romania -- frequently imagined as desirable only if it promotes what they think about it -- is a consequence of the interest for cultural heritage only as archaeological heritage and of a confrontation with aggressive, dogmatically nationalist and anti-European views of the past promoted through various mass-media channels, which are perceived as a continuation of what happened during the 1980s, when alternative nationalist representations of the past were supported by some influential Communist officials against the established academic authority of the archaeologists.

09 WHO IS WHO IN ROMANIAN ARCHAEOLOGY?

Author: Curator, Dr. Coltofean, Laura - Brukenthal National Museum, Sibiu, Romania (Presenting author)
Keywords: Romania, heritage, authority
Presentation Preference: Oral

Since the fall of communism in 1989 and even after joining the European Union in 2007, Romania has been in a constant political, economic, social and cultural transition. This has had strong positive and negative effects on research, including archaeological research. The transition allowed Romania to join the international archaeological community and benefit from its wide range of opportunities. Thus, international collaborations have been established, archaeologists have been introduced to new research methods, and offered various academic mobilities and grants. In short, archaeological knowledge and information have been rapidly and extensively exchanged. Despite this, the Romanian archaeological community is somewhat stuck between an open, dynamic and global society, and the rigid, slowly transitioning government administration and often autocratic public institutions which frequently see the modern and the new as threatening. Archaeologists have to meet the expectations of the system (the institution) in which they work, of the community they live in, and of themselves. Thus, there is a (mostly inner) conflict between the archaeologist as a member of modern society, and the archaeologist as a member and representative of the public institution. How do Romanian archaeologists perceive this situation and their role today? Do they have authority and power or are just made to believe they have? Who is in fact creating and influencing heritage discourses? How did heritage discourses change over the last 28 years in Romania? What was and is the role of archaeologists in this change? The aim of this paper is to present and analyse power relationships and heritage discourses in Romanian archaeology over the last three decades, through qualitative interviews with archaeologists, from early career researchers to experts in the field, with background in museums, academia, and government institutions.

10 THE VAMPIRE STRIKES BACK: DEVIANT BURIAL FINDS BETWEEN MEDIA AND ACADEMIA

Author: Mr Parvanov, Petar - Central European University (Presenting author)
Keywords: public archaeology, funerary
Presentation Preference: Oral

Recently the theme of deviant burials was reappraised in European archaeology, sometimes creating very heated debate over it. While theoretically and methodologically sound inquires are starting to get shape, such findings of unusual nature have attracted significant attention from the media and the wider public. The archaeologists either embraced that situation by providing simplistic stories or felt very strongly against it and virtually excluded it from proper academic discussion.
This presentation will focus not on the strictly archaeological context and interpretations of these finds, but will examine the public representation of them. Particular attention will be given to finds from Bulgaria, championed by the now infamous Sozopol vampire and the following sequence of similar stories from all over Eastern Europe. It will be argued that the drastic division between archaeologists is to a large extent the result of the absent discourse on public archaeology in Bulgaria and Southeastern Europe. Another aspect to be commented on is the mobilization of cultural heritage for economic benefits, especially tourism. In this sense, the reactions from Serbia and Romania deserve special attention. Finally, the academic outrage exemplified by an article by David Barrowclough (2014) will also be accounted for.
The analysis of the competing archaeological discourses will demonstrate the fragile scientific authority. Hopefully, another contribution of the current piece will be to raise awareness and realistic evaluation among (Balkan) archaeologists for their contribution to society on local, national and regional levels.

174 MANAGING ARCHAEOLOGY IN HIGHLY DYNAMIC URBAN CENTRES

Theme: 2. The Valletta Convention: the next 25 years
Author: Bouwmeester, Jeroen (Netherlands) - Cultural Heritage Agency of the Netherlands
Co-Author(s): Belford, Paul (United Kingdom) - Clwyd-Powys Archaeological Trust
Keywords: urban archaeology, heritage management, preservation,
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Archaeological remains in towns and cities have always been under pressure from development. It is often a challenge to preserve these remains, in situ or ex situ. This stands in contrast to the important role urban centres had in the development of our modern society. By the end of the 1970s it was clear that in for example Britain, the Netherlands and Germany a large part of the urban archeological archive had been erased. What is the situation in 2016, 25 years after the Valletta Treaty? Has the situation improved or not, and what can we do to improve it?

In this session archaeological heritage management in an urban context will be divided into three themes:
- Predictive modelling: knowing the location and nature of the (undisturbed) remains, to avoid future damage.
- Keeping the remains in situ: do technical solutions such as piling actually work, and how can the remains be made visible to the public.
- Involving the public: public awareness and support for archaeology is important in enabling its preservation.

We hope to provoke vigorous debate in the session from a wide range of countries. We intend to combine the results of the session in a peer-reviewed publication. Contributors must be willing and able to provide a draft paper in advance of the conference; revisions in the light of discussion will be permitted but publication will take place at the beginning of 2018.

01 INTRODUCTION TO THE SESSION 'MANAGING ARCHAEOLOGY IN HIGHLY DYNAMIC URBAN CENTRES'

Author: Doctorandus (Drs.) Bouwmeester, Jeroen - Cultural Heritage Agency of the Netherlands (Presenting author)
Keywords: Netherlands urban archaeology
Presentation Preference: Oral

Archaeological remains in towns and cities have always been under pressure from development. It is often a challenge to preserve these remains, in situ or ex situ. This stands in contrast to the important role urban centres had in the development of our modern society. By the end of the 1970s it was clear that in for example Britain, the Netherlands and Germany a large part of the urban archeological archive had been erased. In this introductory paper I will give an overview of the history of urban archaeology in Europe in relation to archaeological heritage management. Also I will reflect the Dutch situation to these developments.
In the Netherlands the complex and dynamic circumstances in urban centres led to two contrary developments. On the one hand the State Service didn't register (new) archaeological monuments in urban centres because of the high pressure on land use and partitioned ownership of archaeological terrains. On the other hand infrastructural developments and urban renewal led to the threat of destruction of important sites. Because of this, several towns appointed their own archaeologist to manage this situation. Now, in 2017, most historic towns have their own policy how to deal with archaeological remains, but there are still many challenges!

02 EXPLORING THE ARCHAEOLOGICAL POTENTIAL OF THE ESQUILINE HILL IN ROME.

Author: PhD Boi, Valeria - Freelance (Presenting author)
Keywords: Esquiline, archaeological-potential, historical-cartoghaphy
Presentation Preference: Oral

This paper is aimed at retracing the steps of the reconstruction of the archaeological potential of an area of Rome's historic centre, the Esquiline District, which was the subject of a PhD thesis (University of Sassari, Sardinia, Italy).
This part of the town, roughly corresponding to the Esquiliae of the augustan age, was a peripheral area of the ancient Rome, which had been characterized by the presence of one of its largest republican necropolis, before being redesigned by the imperial Horti.
After the fall of the Roman empire, the landscape kept itself almost intact for centuries, as is shown in the rich historical cartography. In the aftermath of Italy Unification, the landscape of the whole area was heavily twisted, and a regular urban pattern completely erased the original ancient morphology. The rapid and uninterrupted transformation of the modern city, which continues up to the present day, led to the almost complete loss of the archaeological deposit, while the right re-contextualization of the past excavations' documentation becomes more and more difficult.
Thanks to this research, and exploiting the potential of SITAR, a web Archaeological Information System developed by the archaeological Superintendence of Rome, all these documents have been now collected and digitized, and they have been organically connected in order to reconstruct the transformations of the Esquiline landscape. An altimetric and cartographic database has been created, by collecting all the altimetric data coming from both archaeological documents, such as the renowned Lanciani's "Forma Urbis Romae", and from the XIX century's urban planning maps. By comparing past and recent excavations' results, altimetric data, iconographic and cartographic sources, a map of the archaeological potential of the area has been created, which can be used for locating its preserved archaeological deposits and for orienting future archaeological surveys, preventive archaeology and urban planning.

03 ARCHAEOLOGY FRIENDLY BUILDING IN A CITY CENTRE: MISSION ACHIEVED OR MISSION IMPOSSIBLE?

Author: Doctorandus (Drs.) Groenendijk, Maarten - Municipality of Gouda (Presenting author)
Keywords: dilemmas preservation Gouda
Presentation Preference: Oral

During the last 25 years, the preservation of archaeological remains, preferably in situ, has been the goal of archaeologists worldwide. Achieving this goal has proven to be quite a challenge, particularly with building developments in dense urban centers. Conflicting interests between developers and archaeologists combined with the logistic and technical limitations of building in a city centre can make preservation in situ difficult to achieve.
Difficult, but not impossible. Between 2006 and 2009, the Koningshof location in the medieval city centre of the Dutch city Gouda was developed using a method called archaeology friendly building. More than ten years old now, this method, combining several technical solutions to realize a building project while preserving the archaeological remains underneath, is still very much up to date.
Archaeology friendly building has been addressed before at the EAA, so this paper will not go into the methodology in detail. Instead, we will look at the multitude of aspects involved in creating and executing a plan like this in a highly dynamic urban environment, and the dilemmas and questions that arise prior to- and during the realization. Are the archaeological remains underneath the new buildings really preserved, considering the fact that piles where used? What amount of disturbance of the archaeological remains do we accept? Should the site be monitored? How can we know and predict what we are preserving underneath the buildings? Do we even need to know? What to do when things go wrong, now and in the future?
With each building project in the city, quite controversial choices and decisions like these have to be made, and lacking a guideline, each city has to make theses choices by itself. The way Gouda did this in 2006 will be presented during the presentation, and is up for discussion afterwards!

04 CASTLE HILL AND UPPER CASTLE IN VILNIUS: INTERACTIONS BETWEEN NATURE, HERITAGE, AND DYNAMIC URBAN CENTER

Author: Povilaityte-Leliugiene, Edita - Vilnius Academy of Arts (Presenting author)
Keywords: archeology, heritage, management
Presentation Preference: Oral

Keeping the erosive Castle Hill with the fragile remains of Upper Castle on it in Vilnius (Lithuania) is one of the serious objectives for conservationists, geologists, archeologists, architects, engineers, politicians, and others in the coming years. The intense processes of slopes' deformations and landslides (2008, 2010, 2016–2017) disclose an example of

bad managing of the archeological site in expanding the urban center. Long lasting intensive archeological researchers in the surroundings of the Castle hill with large-scale reconstructions and rebuildings of Lower Castle's buildings (as complex of Old Arsenal, Grand Duke palace) as well as imprudent restoration, conservation projects of Upper Castle and engineering works to stabilize the processes of the hill made in two last decades of 20th century badly affected condition of the hill nowadays. Of course, as one of the reasons of intensive geological deformations is also growing transportation in the area. Even Vilnius historic center was inscribed on the UNESCO World Heritage List in 1994, but a deficiency of sensitivity for the perception of heritage did not create the base for integrated of nature and heritage protection models in Vilnius. So this paper from the historic perspective will discuss the effects of Upper Castle's conservation, restoration works (1955–2014), management of hill's slopes (as poles system construction to protect from slides or elimination of trees (1985–2015) and will raise the question if the rebuilding processes was the good examples of protection measures of this archeological site. The values of the heritage objects settings were emphasized in Convention of Valletta, but most of the protection projects of Upper Castle and hill itself was not complex. Therefore the paper will then reveal links between the heritage managements and growing needs of the urban center and how technical solutions could protect castle in situ.

05 MANAGING MEDIEVAL ARCHAEOLOGY IN URBAN AREAS IN NORWAY

Author: Ms Johansen, Lise-Marie Bye - NIKU - Norwegian Institute for Cultural Heritage Research (Presenting author)
Keywords: heritage management, preservation
Presentation Preference: Oral

Development projects in urban areas constitute one of the greatest physical threats to the Medieval Towns in Norway. This presentation discusses the preservation state and heritage management of the Medieval Town in Oslo. What is the situation in 2016, 25 years after the Valletta Treaty?

The Medieval Towns are scheduled cultural heritage objects. Management of Medieval Towns changed in 1990s. The Norwegian Directorate for Cultural Heritage established a policy to preserve archaeological remains in situ. This made it possible for developers to build on top the layers, instead of removing them.

Augering became a common archaeological method in the cities, used for prospection, to document thickness and preservation of the deposits and to excavate pile locations, before piles were driven into the ground. This change in management in 1990s encouraged research on deposit monitoring, and research on non-destructive methods in general.

Nowadays Oslo faces a major population growth. Urban development and densification is expected within the current building zone. In 2013 it was decided that Oslo needed an extended railroad. This is constructed below ground level, through the core of the medieval town. This ongoing rescue excavation is producing enormous archaeological material. It also gives our generation of archaeologists a unique possibility to evaluate the 25 years of preservation in situ strategy.

06 THE CONSTRUCTION OF THE NEW STATION AREA IN UTRECHT: A DECADE OF PRESSURE COOKER ARCHAEOLOGY

Author: Drs Oudhof, Jan.Willem - Buro de Brug (Presenting author)
Keywords: Managing urban archaeology
Presentation Preference: Oral

Utrecht is building a new Central Station Area. This is one of the major transformation projects in the Netherlands. The Municipality of Utrecht formulated an ambitious redevelopment plan together with stakeholders. This was much needed; ever since the Hoog Catharijne shopping mall was built in the 70s there has been a maintenance backlog, neglect, a growing number of passengers, a growing city and the desire to get water back into the old canal. With the construction of a new and renewed area all these things are tackled at once. The historic city center and the Station Area were two separated parts of Utrecht; these parts will be connected again to form one coherent center. Livability and safety will be improved. One of the most important archaeological themes in this area is Vredenburg Castle: a 16th-century castle built by emperor Charles V. Some remains of the castle, which stood for only 40 years, are still visible. Some parts are preserved in situ, other parts are replaced in the public space. The main part of the archaeological sites is only available for research during the construction period, for example a five level parking garage or the deep sewerage system. This means dynamic as dynamic can be.

07 MANAGING ARCHAEOLOGY IN URBAN CENTRES IN THE FRENCH SPEAKING PART OF SWITZERLAND

Author: Conservatrice du patrimoine archéologique Liboutet, Marion - Canton de Vaud, Switzerland (Presenting author)
Keywords: protection, conservation, urban
Presentation Preference: Oral

With growing populations and important economic activity, the pressure imposed upon a territory by construction projects is considerable. This is particularly the case in Canton Vaud (the French speaking part of Switzerland). Large urban centres endure significant changes to their structure, as do historic buildings. The surface area of towns and cities is also on the increase. Indeed causing them to be gradually integrated into the urban network. The scale of housing construction and infrastructure expansion does not spare medium sized towns, which also undergo major upheavals. Known archaeological urban remains, and those as yet undiscovered, are therefore seriously threatened. Issues of detection, conservation and study of archaeological remains are intrinsically linked to planning and development. The archaeological services dedicated to heritage protection have to ensure the safeguarding of archaeological remains and in-situ conservation and if this proves impossible, scientific documentation through archaeological excavation. The aim of this presentation is to illustrate the tools used by the Canton Vaud to protect archaeological remains in advance (perimeters of protection, prior studies of fortification location and legislative measures), to show the types of recurring operations seen in the last few years (such as the repair of public infrastructures and the transformation of old buildings) and the results these operations have contributed in scientific terms as well as their scope in providing the general public with knowledge of their town or neighbourhood. Finally there is also the question of practical limitations in cases when it is impossible to conserve remains in-situ and their destruction is thus conceded.

176 EUROPEAN ELECTIONS 2019 – BENCH MARKS FOR ARCHAEOLOGY AND HERITAGE PROTECTION

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author: Lodewijckx, Marc (Belgium) - Leuven University (KU Leuven)
Co-Author(s): Karl, Raimund (United Kingdom) - Prifysgol Bangor University
Keywords: politics – Europe – heritage
Presentation Preference: Round table

In the run up to the 2019 European elections the Political Strategies Committee seeks to develop a project to examine political parties' plans for archaeology and heritage protection. Following examples by German DGUF, this would include creating a short-list of the most urgent concerns („Wahlprüfsteine") in the field of archaeology and heritage protection on European level with the help from EAA committees and partner organisations. After the Round Table, the European Parliamentary parties would be requested to give statements on this list of questions thus setting themselves bench marks. These statements of intent will be commented on, summarized and widely published by us to allow those interested in archaeology and heritage to make well-informed choices in the coming European Elections.

01 ELECTION BENCHMARKS: AN INSTRUMENT TO BRING ARCHAEOLOGY TO POLITICIANS AND VOTERS

Author: PD Dr. Siegmund, Frank - DGUF; Universität Düsseldorf (Presenting author)
Keywords: EAA, DGUF, election
Presentation Preference: Oral

Election benchmarks are a formal instrument through which interest groups can neutrally communicate with political parties and voters during upcoming elections. Since 2009, the German Society for Pre- and Protohistory (DGUF) uses this instrument for the fifth time already. The process is as follows: a short specific catalogue of archaeology relevant questions is formulated and sent to the parties. The politicians are requested to reveal how they are going to act – for example regarding legislation or financing of archaeology – during the next legislative period. The answers of the parties are collected and published in order to provide voters interested in archaeology with criteria for their decision. If repeated, election benchmarks can be used to hold governing parties accountable for statements they made during previous polls. The paper will describe DGUFs experiences with election benchmarking in order to enable EAA and its members to decide whether they want to use this instrument in the run-up to European elections.

178 ARCHAEOLOGY OF RIVERS AND LAKES: WHEN THE WATER IS THE BRIDGE

Theme: 6. Interpreting the archaeological record
Author: Tiboni, Francesco (France) - Centre Camille Jullian - Université Aix-Marseille 1
Co-Author(s): Sanna, Laura (Italy) - Università di Milano - Cattedra di PreistoriaGaspari, Andrej (Slovenia) - University of Ljubljana - Faculty of Arts - Department of ArchaeologyToth, Attila (Hungary) - Árpád Museum, Ráckeve
Keywords: rivers, lakes, wrecks, harbors, pile-dwellings
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Since the prehistory, different human groups have chosen to settle next to the waters of many European waters. The presence of fresh water, of fishes and molluscs, of material resources and the possibility to use rivers and lakes as waterways, or as a natural defence, have often been at the base of this this choice. Born in the 19th century on the Alpine Lakes of Switzerland, the European Underwater archaeology has always been attracted by the study of the specific environment. But, while on the one hand at its early stage, the discipline was mainly linked to the investigation of the pile dwellings dating from the Neolithic to the Iron Age, in recent years the agenda has changed. The recent increase of the underwater archaeological researches has unveiled many information referring to different periods and to important historical events. The possibility to investigate the waterbasins of Europe, as well as of the rivers running among different countries, has in fact enabled researchers to discover many new sites and wrecks that demonstrate a great vitality of these environments and the role that some of them have played in some crucial historical event. Particularly in central Europe, where rivers valleys have been often used as primary communication and transport corridors, rivers were used as waterways, and they have often been considered as political and cultural borders by different countries. Often forgotten, the memory of this long relationship between men and freshwaters, hidden under the surface, is nowadays constantly coming back to light.

01 THE RICH SUBMERGED HERITAGE OF FRENCH RIVERS: A LONG-TERM STUDY

Author: ANNIE, DUMONT - French Culture Ministry; DRASSM; UMR6298 ARTEHIS (Presenting author)
Keywords: fluvial archaeology, France
Presentation Preference: Oral

The French rivers preserve a diversified heritage (bridges, fisheries, boat mills, ...) which is linked to different periods, from the Bronze Age to the 19th century. In this contribution, a synthesis of the recent discoveries, especially in Loire and Doubs, will be presented.

02 MUDDY WATERS AN INTERNATIONAL, INTERDISCIPLINARY, THEORETICAL APPROACH TO THE QUESTION WHY PEOPLE INITIALLY SETTLED LACUSTRINE ENVIRONMENTS IN THE EUROPEAN NEOLITHIC

Author: M.A. Verdonkschot, Jadranka - Universität Tübingen; Universidad de Alcalá (Presenting author)
Keywords: Neolithic, lakeside settlements
Presentation Preference: Oral

The presentation concerns my PhD research project, which will be handed in by April. Lakeside settlements have been the subject of archaeological research in Europe for the biggest part of two centuries, starting with the excavations conducted on the Swiss lakeshores and spreading from there. This work poses the question what moved people in different parts of Neolithic Europe to start settling wetlands. Fishing, the control of waterways, the vicinity of resources, a defensive position, demographic pressure and the ease

of construction have all been mentioned in literature, but in-depth studies are absent and most reasoning is general, environmentally deterministic and lacking the acknowledgement of non-practical factors. The current work both plays into an existing knowledge gap and aims to develop and present a highly inclusive (focusing on international and interdisciplinary aspects) and theoretical approach. Four archaeological case studies from different European regions were selected, sharing the trait that they are the oldest known lakeside settlements in their respective areas. These are Egolzwil 3 (4300 BC, Switzerland), Hörnle I (3900 BC, Germany), La Draga (5250 BC, Spain) and Dispilio (Greece). A profound assessment of the material record from these settlements was carried out, based both on direct resources, such as raw materials, and indirect (intangible) resources, with a strong focus on regional contacts and landscape. Additionally, two anthropological case studies were included; the ribeirinhos societies (Amazon floodplains) and Amsterdam (the Netherlands) in order to attest for issues that are traced with difficulty in the archaeological record and to provide a different point of view. After an exhaustive assessment of the situation presented by each site several hypotheses are formulated to extract the factors at play in the decision to settle the lakeshore at each settlement from the archaeological data.

03 A RIVER RUNS THROUGH IT: THE MANIPULATION OF FLOW AND THE IMPORTANCE OF FLUVIAL ARCHAEOLOGY

Author: Mr Pedrotti, Felix - University of Southampton (Presenting author)
Keywords: Po, Riverscape, Navigation,
Presentation Preference: Oral

The Italian river Po represents a vital mean of communication, transport and interaction between Italy and the Adriatic. It is characterised by a complex fluvial landscape where anthropogenic activities and environmental forces are inextricably linked. Since prehistoric times this riverine network provided its surrounding communities with subsistence resources and by the peak of Etruscan culture it had evolved into a political and cultural 'highway' connecting disparate landscapes, from lake-strewn mountains to promontory forelands, down to coastal lagoons converging into the Adriatic Sea.
As its surrounding inhabitants progressively realised that the riverine flow could be manipulated to irrigate the adjacent land, they constructed extensive channels to facilitate the navigation of the fluvial network. These interactions, combined with a growing deforestation of the surrounding areas, had a heavy influence on the sedimentation processes of the hydrographic network. Over the last 2500 years the Po and its delta bore witness to numerous relocations, dramatically altering the social behaviours of its inhabitants and affordances to mariners, at the same time as it was being altered by those living and working along its course .
The extent of these factors means that if we wish to understand anthropogenic impacts on this network, and vice-versa, it is vital to investigate the geological background of the river first, allowing the reconstruction of the milieu within which it took place. This paper will discuss and evaluate the potential of a digital paleogeographic reconstruction of the fluvial landscape during the Etruscan and Roman periods, by using modern geophysical technologies and state of the art software such as ArcGIS and Petrel. This process in combination with the extant archaeological record will refine our understanding of the relationship between fluvial communities and their riverine cultural landscape as well as the anthropogenic impacts, which shaped the river as it exists today.

04 NORTH TO SOUTH. WATERS AND WATERWAYS IN NORTHERN ITALIAN ALPS

Author: Dr. Marzatico, Franco - Soprintendenza per i Beni Culturali di Trento (Presenting author)
Co-Author: Dr. Tiboni, Francesco - ATENA - CuMaNa - GENOVA
Keywords: Pile-Dwelling, Alps, Gewasserfunde
Presentation Preference: Oral

The paper deals with the special relationship existing among human groups and waters around the Alpine region of Northern Italy during the Neolithic, the Bronze Age and up to the Iron Age.
The author will discuss the use of lakes and rivers as waterways as well as the presence of ritual hoards and finds in the Northern Italian Region.
This paper will deal not only with the pile-dwelling sites of the Alps, but even with the rivers and the riverine environment.

05 LINKING ACROSS THE LAKE: BRONZE AGE EXCHANGE SYSTEMS IN THE NORTHERN ALPINE REGION

Author: Post-Doctoral Research Assistant Jennings, Benjamin - University of Bradford (Presenting author)
Keywords: lake-settlements, networks, exchange
Presentation Preference: Oral

The well known lake-settlements of the northern Alpine region have provided a wealth of knowledge concerning populations within the lake margins, and a depth of understanding of material culture employed by those societies. Less well understood are the populations living at greater distance from the lake, but artefacts do provide some indications. Stylistic designs occurring on a range of material culture items attest to both regional and inter-regional routes of exchange and interaction. This paper will detail exploratory network analysis hinting at the significance of lakes as elements both unifying and dividing regional populations, and artefact distribution maps providing further indications for an integrated lacustrine and riverine system moving artefacts away from, and in to, the northern Alpine region and lake-dwelling production centres during the Late Bronze Age (c. 1100 – 800 BC).

06 PLACE OF VARDAR AND STRUMA RIVER VALLEYS IN THE CULTURAL NETWORK OF CENTRAL MACEDONIA IN THE LATE BRONZE AGE

Author: MA Bahyrycz, Cezary - Institute of Archaeology, Adam Mickiewicz University of Poznan (Presenting author)
Keywords: LBA, Aegean, Balkans
Presentation Preference: Oral

Late Bronze Age was a time of increase of population mobility in Europe and beginning to the formation of elites which laid foundations of European civilization. During this period, a region located within today's northern Greece - Central Macedonia functioned between two dynamically developing and significantly different centers, the Aegean and the Balkans, which are linked by the watercourses – two rivers.

The primary goal of the project is the recognition of character, frequency and methods of contacts between prehistoric communities living in the valleys of Vardar and Struma rivers which today are located within Greece, Bulgaria and Macedonia. Archaeologists highlight the crucial importance of those watercourses; they could be the main thoroughfares between past human populations. Vardar and Struma are indirectly connected with the significant river for prehistoric times of central Europe - Danube.

The project's aim will be achieved by the analysis of the pottery remains. The starting point is currently ambiguous opinion of specialists about the origins of ceramic production in the region, northern character of pottery vessels or the importance of southern influences. Moreover, archaeologists point to the unique character of the Central-Macedonian pottery craft, as well as syncretic, combining the features of neighboring areas. The purpose is an attempt to verify these hypotheses, or present a new explanation. Special attention will be focused on "incised" and "encrusted" ceramics. An additional aim is going to be the recognition of Aegean features within repertoires discovered in the valleys what has never been the subject of detailed research.

The author plans to make a revision of the ceramic source materials, found on the sites of aforementioned valleys. Looking for similarities and differences could be useful in investigation of issues concerned interregional communication between Northern and Southern communities of Europe and importance of rivers as "bridges" between prehistoric societies.

07 WATERS BETWEEN THE CIVILIZING FACTOR AND SEDES DEORUM IN LATE IRON AGE NORTH-THRACIAN LANDS

Author: PhD Mandescu, Dragos - Arges County Museum (Presenting author)
Keywords: Water Rituals Flussfunde
Presentation Preference: Oral

The PPT presentation highlights the considerable cultural role played by the waters for the North Thracian communities at the Lower Danube during pre-Roman period. They are presented and discussed case studies dating back from the last 500 years BC, exemplified by archaeological finds and discoveries made in North-Thracian area (Romania and Northern Bulgaria) that revolve around the Lower Danube. From large rivers, such as the Danube and its tributaries from North, like Siret, Argeș and Jiu Rivers, who played an important role for communications and penetration of the elements of civilization and acculturation from Hellenistic and later Roman world (importations, luxury ceramics and fashion elements, prestige goods like the Aegean wine and oil) in the local Getae and Dacian society, to the extraordinary Flussfund (stray finds like weapons, helmets, adornments etc. – depositions with votive character, some parts belonging to known types - such as the helmet from Budești, others being unique artifacts, with unusual shapes - like the sword of Dobolii de Jos), to collective discoveries or deposits testimony of practicing certain rituals and ceremonies at the edge of lakes and bogs (a phenomenon present both within the pre-Roman Gaetian and Dacian classical culture – i.e. Contești site, but also in the neighbored culture east of the Carpathians, Poienești-Lukaševka, assigned to Bastarnae – i.e. Lozna site). The interpretations of these collective deposits type findings are various, ranging from ceremonies to celebrate the forces of nature, great feasts of the community as a result of wealthy hunting, or persuasion and contentment of the gods of war after victorious battles etc. All this provides a consistent view of how communities of the Late Iron Age in North-Balkan fringes related to the water, both from a practical and profane standpoint, as well as a symbolically sacred, consecrated one.

08 ROMAN SEWN BOATS OF NORTHERN ITALY AND THEIR SECOND LIFE

Author: Dr. Tiboni, Francesco - ATENA - CuMaNa - GENOVA (Presenting author)
Keywords: Sewn-boats, rivers, naval-archaology
Presentation Preference: Oral

The study of the sewn boats of the northern Adriatic dating to Roman era allows us to put in evidence some important features regarding their shipbuilding technology and use. According to some of the most recent studies, we can often recognize their area of construction and use and, in many case, we can see how this particular structure have been re-used after being abandoned.
Starting from the analysis of one of the older samples we have at our disposal, the sewn boat from Cavanella d'Adige, dated to the II-I century BC, this paper will discuss the use and re-use of this particular class of boats. The wreck has been recovered from a small canal, in the area of the mouth of the Adige River, re-used under a layer of clay and wood possibly as a riverbank.
Starting from the analysis of the particular context and some important parallels from the same region and abroad, the study will then focus on the possibility to understand why, in many cases, at the end of their service, parts of these boats have been re-used in fluvial context.
The paper will present some first-hand information about the boat from Cavanella and will discuss it in the wider context of the Northern Italian Adriatic region of Roman era together with other samples coming from the same region.

09 RIVER DIMENSION: CONTRIBUTION OF UNDERWATER ARCHAEOLOGY TO THE BETTER UNDERSTANDING THE ROLE AND FUNCTIONS OF THE DANUBE

Author: Dr. Tóth, Attila - Árpád Múzeum, Ráckeve (Presenting author)
Keywords: river, environment, sites
Presentation Preference: Oral

Recent underwater archaeologycal researches, combined with analysis of old maps and data from riverside sites gives insight into the use of the Danube river. Wrecks, ports, settlements under the water and on the riverbanks will be presented and a summary of chronologycal questions, testimonies of changing of environment and technologies, and strategies to adapt to "riverside life" are the theme of the paper.

10 A 16TH CENTURY VENETIAN CARGO FROM THE GARDA LAKE – FIRST NOTE

Author: Dr. Sanna, Laura - Università degli Studi di Milano (Presenting author)
Keywords: underwater-archaeology, wreck, Venice
Presentation Preference: Oral

In the winter of 2016 the archaeological team of the ATENA CuMaNa, under the scientific direction of the Superintendence of the Province of Brescia and in association with the Italian Council of Research – Marine Robotics has undertaken a first non-destructive campaign of research on a wrecksite in the waters of the Lake of Garda (Northern Italy). Discovered by the local group of the Volontari del Garda – Nucleo Sommozzatori, the site appears to be a small merchantman with a load made of Venetian figured pottery dated at least to the 16th century AD.
In this paper, the author will present the results achieved after the first short instrumental campaign of research, thanks to which it has been possible to identify some important features of both the boats and the load.
Further, the author will discuss the research strategy that will be used in the next campaigns of research by the archaeological team of ATENA CuMaNa and the Italian CNR. Due to the depth, in fact, the site will be investigated by the use of both robots and divers, in order to verify how men and robots can work together in underwater archaeology in a proper way.

11 NORTH/SOUTHLINE METRO ARCHAEOLOGY. THE NIEUWEBRUG (NEW BRIDGE) IN AMSTERDAM

Author: Prof. Gawronski, Jerzy - Office for Monuments and Archaeology, City of Amsterdam (Presenting author)
Keywords: urban archaeology, Amsterdam
Presentation Preference: Oral

The construction of a new subway line, the North/Southline metro, in Amsterdam from 2003 to 2015 provided opportunities for extensive archaeological work in the riverbed of the river Amstel in the historic centre of Amsterdam. The new line was tunnelled at average 25m – OD. Along the line a number of building sites for stations was created which provided access to deep excavations inside the riverbed from surface level. A riverbed like that of the Amstel is a rich reservoir of material remains, consisting of individual lost objects but primarily of urban waste, which for centuries sunk into the muddy riverbed, to a maximum depth of 12 m - OD.
In essence, the archaeological project was directed towards exploring multicontextual directions in urban archaeology to give meaning to the extensive archaeological find complex from the riverbed in relation to the city's topography and the city's main waterway. The underwater context of the river Amstel with its sunken material residue is represented as source of chronological, physical and cultural data on themes of urban development and the social and economic history of the city of Amsterdam.
One of the main sites was located at the Nieuwebrug (New Bridge) in the Damrak, the former river mouth at the harbour (the IJ) of Amsterdam. This bridge dates back to the 14th century and played a key role in the city's ever changing infrastructure. Within the methodological approach of the archaeological research the historical topographical features of the bridge where used to build a functional framework for find analysis. This led to interaction between tangible material and historical data and provided new and direct images of the urban role of the bridge in a spatial, maritime, social and military context.

12 THE PHENOMENON OF THE MEDIEVAL SWORDS IN WATERY CONTEXTS REVISITED: THE LJUBLJANICA RIVER CASE STUDY.

Author: Dr. Gaspari, Andrej - University of Ljubljana, Faculty of Arts, Dept. of Archaeology (Presenting author)
Keywords: Medieval, weapons, water
Presentation Preference: Oral

The paper will discuss the phenomenon of the unusually high number of medieval swords recovered from the River Ljubljanica in its stretch across the Ljubljansko barje. The majority of the over 56 sword finds is marked by an absence or lack of context data, which call for a more in-depth analysis of the so-called internal markers of individual finds, such as the state of preservation upon discovery, traces of damage or manipulation and presence/absence of scabbard remains. The results of this analysis add to those of the typo-chronological analysis of weapons and even, to a certain degree, help focus the study on the interpretations or hypotheses concerning the circumstances and causes that brought the swords to the bottom of the river.

13 THE INFLUENCE OF THE RIVER RHINE AND ITS FLOODING ON THE MEDIEVAL LANDSCAPE OF THE UPPER RHINE VALLEY

Author: Conijn, Arjan - University of Heidelberg (Presenting author)
Co-Author: Lange, Janine - University of Heidelberg; Prof. Dr. Meier, Thomas - University of Heidelberg; Dr. Mächtle, Bertil - University of Heidelberg
Keywords: Rhine, Flooding, Geo-archaeology
Presentation Preference: Oral

The aim of the interdisciplinary project 'Land unter', which is funded by the Thyssen foundation, is to develop a regional history of floods and flood prevention measures based on archaeological and geomorphological studies on the upper Rhine between Strasbourg/Kehl and Mannheim/Ludwigshafen. Central in this study is the shifting relationship of the riverbed inhabitants with the river Rhine. Although several villages have been situated in the floodable riverbed since at least the 8th century, protective dikes did not appear until the 12th century.
By using historical sources and geo-archaeological methods we aim to reconstruct the situation of the meandering river during medieval times. This includes a study on former river arms, but one of the most important questions is whether flooding occurred at all during this period. In order to understand connections between the villagers and river dynamics a combination of LiDAR-data, archival sources and soil samples will help to date dikes as measures of flooding prevention, i.e. as manipulations of nature.
While a case study around Speyer so far did not prove any medieval protection of the town against the river, a second case study near Rastatt proveds dikes which according to written sources should date back at least to the 15th century; probably they reach back into the high middle ages. Dating these dikes and reconstructing its environment during the next summer will provide a valuable insight in medieval life along the Rhine. In addition it is important to consider from which period of time a changing understanding of nature allowed to accept flooding disasters no longer as an expression of the divine will, but rather as a challenge to shape and control nature.

14 POTENTIAL OF RIVER VÁH (SLOVAKIA) - THE FIRST UNDERWATER ARCHAEOLOGY SURVEY.

Author: PhD. Daňová, Miroslava - Trnava University in Trnava, Faculty of Philosophy and Arts, Department of Classical Archaeology (Presenting author)
Co-Author: PhDr./PhD. Daňová, Klaudia - Institute of Archaeology, Slovak Academy of Sciences, Nitra, Slovakia; Mgr. Stehlíková, Jana - Zavod za Podvodno Arheologijo, Brezovica pri Ljubljani, Slovenia
Keywords: Slovakia, underwater archaeology
Presentation Preference: Poster

The river Váh is the longest river flowing through Slovak territory. It has got the overall length of 403 km. The goal of this submission is going to be the introduction of the potential of this waterway for the survey of underwater archaeology. The character of this river has been gradually changing from a small stream to a river with the average flow of 196 m^3/s in its mouth into Danube. There are several water projects built on the river with flooded archaeological localities. Fords crossed the waterway, and there were also bridges and different structures on wooden piers (watermills,..) built on it. The most important structures and changes of the flow were documented due to historical mapping. Remains of wooden constructions on the level of town Hlohovec (possibly of bridges) were in the past partly examined without any publication of the results. Another dozens of localities still await for its potential to be discovered.
Current extraction of gravel and an absence of a group of archaeologists with the ability to do surveys underwater, which has lasted until now, significantly endangers Slovak cultural heritage. This is one of the pilot submissions for the newly forming working group which would like to focus on underwater archaeology long-term.

182 RECONSTRUCTING PREHISTORIC IDENTITIES AND LIFE HISTORIES THROUGH ISOTOPES

Theme: 6. Interpreting the archaeological record
Author: Fernandez-Crespo, Teresa (Spain) - University of the Basque Country; University of Oxford
Co-Author(s): Snoeck, Christophe (Belgium) - Vrije Universiteit Brussel
Keywords: Isotope multi-analysis, life histories, prehistory
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Isotope analysis has become a mainstream of bioarchaeological research in prehistory, being the most direct measure of human diets, subsistence and mobility, and, indirectly, of social organisation and differentiation. However, multi-analyses at an individual level using a variety of tissues (e.g. bone, dentine, enamel, dental calculus, hair) are rare, despite their potential to offer valuable information on individual life histories.

Stable carbon and nitrogen isotope analysis of bulk bone and sequential tooth dentine collagen, for example, allows increasing the temporal resolution of signatures and tracking dietary changes throughout life, especially those related to important social variables like weaning or the adoption of a fully adult diet, as well as aspects such as dietary differentiation within communities.

Strontium isotope analysis of tooth enamel and comparison with the variability of bioavailable strontium isotope ratios becomes especially interesting when sequential or bulk samples of the first, second and/or third molars are tested, providing data on mobility over 15 years of the person's early life and insights into group composition. Moreover, coeval examination of other isotopes, like oxygen, can offer additional spatial resolution.

This session will focus on isotopic approaches to gain insights into life histories and group identity in prehistory. Submissions aiming chronological reconstructions of dietary intake and/or mobility patterns using a variety of biological remains are especially welcome, as well as case studies combining isotopic and archaeological information to look into population dynamics, subsistence or migrations. Contributions presenting new intra-individual sampling techniques or addressing pitfalls in the methodology used are also encouraged.

01 EARLY FARMERS OF NORTHWEST ANATOLIA: NEW DIETARY ISOTOPE STUDIES OF BONE COLLAGEN AT NEOLITHIC BARCIN HÖYÜK AND AKTOPRAKLIK

Author: Dr Budd, Chelsea - Independent Researcher (Presenting author)
Keywords: Neolithic Palaoediet Isotopes
Presentation Preference: Oral

The process of neolithisation from its core beginnings in southwest Asia into Europe remains intensely debated (Krauβ 2011; Özdoğan 2014). The absolute chronological frameworks for the westward expansion of the Neolithic are fairly well studied (Brami and Heyd 2011, Özdoğan 2011), but the agents of change which drive this transition, the social and economic transformations, are less well understood due to a paucity of archaeological evidence in the critical regions between southeast Europe and southwest Asia (Çakırlar 2013). Northwest Anatolia – which lies within these critical regions – is thus pivotal in understanding the spread of the Neolithic into Europe. Recent data sharing research (Arbuckle et al. 2014) demonstrates that i) the westward expansion of Neolithic subsistence technologies combined multiple routes and pulses but did not involve a set 'package' comprising all four livestock species including sheep, goat, cattle and pig, and ii) during the transition to agro-pastoral economies interactions between domestic stock and local wild fauna continued. Here we present stable carbon and nitrogen isotope ratios from human and animal bone collagen from two integral Neolithic sites in the study region; Barcın Höyük (c.6600-6000calBC) and Aktopraklık (c. 6400–5600calBC), to investigate the relative contributions of domestic fauna, wild fauna, and plants to long-term human diet in northwest Anatolia.

02 INFANT FEEDING PRACTICES AND BREASTFEEDING STRATEGIES AT THE ADVENT OF NEOLITHIC IN THE CENTRAL BALKANS

Author: Jovanović, Jelena - BioSense Institute, University of Novi Sad, Serbia (Presenting author)
Co-Author: Goude, Gwenaëlle - Aix Marseille Univ, CNRS, Minist Culture & Com, LAMPEA, Aix-en-Provence, France; Novak, Mario - Institute for Anthropological Research, Croatia; Bedić, Željka - Anthropological Centre, Croatian Academy of Sciences and Arts, Croatia; de Becdelièvre, Camille - Laboratory for Bioarchaeology, Department of Archaeology, Faculty of Philosophy, University of Belgrade, Serbia; Stefanović, Sofija - BioSense Institute, University of Novi Sad, Serbia; Laboratory for Bioarchaeology, Department of Archaeology, Faculty of Philosophy, University of Belgrade, Serbia
Keywords: Neolithic, breastfeeding, isotopes
Presentation Preference: Oral

Examining individual life-histories provide a direct way to understand the mechanisms of population's adaptation to major ecological and socio-cultural changes. The Mesolithic-Neolithic transformations offer a convenient frame to develop this bottom-up approach. The Neolithic transition, the passage from mobile foraging to sedentary farming, was a major shift during human prehistory. Focusing on the Balkan region where Early Neolithic started around 6200 cal BC, this paper presents stable isotope results (carbon, nitrogen, sulfur) of an intra-individual sampling strategy (data on bone and deciduous/permanent teeth) performed on 30 children from Mesolithic and Neolithic sites situated across Serbia and Croatia. Results suggest significant differences in the feeding practices of Mesolithic and Neolithic children as well as regional differences in mother's dietary choices. This study opens new horizons on the relationship between individuals subsistence strategies and the dynamic of the group, implying that these bio-cultural differences may contribute to the important demographic changes observed at the Mesolithic-Neolithic transition.

03 EXPLORING HUMAN SEDENTISM IN ITALY DURING NEOLITHIC AND COPPER AGE: INSIGHTS FROM OXYGEN ISOTOPE ANALYSIS

Author: Dr Anzivino, Laura - Centro di Antropologia Molecolare per lo Studio del DNA Antico, Dipartimento di Biologia, Università degli Studi di Roma Tor Vergata
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Keywords: Italy, Prehistory, Isotopes
Presentation Preference: Oral

The transition between Neolithic and Bronze age was characterized by technical innovations that facilitated the development of agriculture, the secondary product revolution, and the onset of specialized handicrafts related with copper exploitation. Human civilizations began to abandon nomadic life of foragers for more sedentary lifestyles, in a gradual process that led to a growing awareness of territoriality and social stratification based on power and richness, as suggested by residential areas with different size, the spread of arms, and diversified funereal practices.
This paper reports on the first results of tooth enamel oxygen isotope measurements on ten Eneolithic and Neolithic communities from across Central and Southern Italy, with the aim of investigating human sedentism. Oxygen isotopes in consumer tissues are related to ingested water and, therefore, to local water sources. Accordingly, they have often been used to address questions about past human mobility. The whole sample, pertaining to 125 enamel specimens, represents, to the best of our knowledge, one of the leading surveys for this timeline.
In spite of the difficulties related with the interpretation on the oxygen data, associated to errors in the calibrations of the raw data, uncertainties in the identification of the water sources used by these populations, food and drink manipulations, and the lack of direct drinking water measurements, it was possible to identify outstanding individuals that show differences if compared to the rest of the local population: FNR 6.1 (Fontenoce di Recanati, MC), CQF 2.2(Osteria del Curato, RM), and four outliers from Buca di Spaccasasso (GR). Although in progress, this research has allowed for the first time to evaluate sedentism of Italian communities during the Neolithic and Bronze Age transition and the ongoing multi-elemental isotopic analyses, together with the genetic characterization of the anthropological remains, will help further in clarifying this complex picture.

04 MODELING DIET IN THE WEST SWEDISH FUNNEL BEAKER CULTURE

Author: Mr Sjogren, Karl-Goran - Göteborg university (Presenting author)
Keywords: diet, isotopes, TRB
Presentation Preference: Oral

The area of Falbygden in western Sweden is known for its concentration of passage graves, built ca 3300-3000 BC. Due to calcareous soils, bone preservation is generally good. Through recent excavations and analysis, a substantial series of isotope measurements (13C and 15N) are now available from humans as well as from animals and cereals. This presentation will discuss how these can be used to model the neolithic diet in the area. The result of the modeling suggests high plant contribution, and contradicts earlier suggestions of a pastoral economy.

05 OF SHIPS AND SHOES AND SEALING WAX, OF CABBAGES AND KINGS: MODELS FOR BRONZE AGE MOBILITY FROM THE NEXUS OF ISOTOPE SCIENCE AND ARCHAEOLOGICAL THEORY

Author: Doctor/Phd Reiter, Samantha - The National Museum of Denmark (Presenting author)
Co-Author: Prof. Frei, Karin - The National Museum of Denmark
Keywords: Bronze Age, identity
Presentation Preference: Oral

This paper presents a model for the interpretation of high-resolution mobility timelines for ancient individuals by associating different patterns of movement with the various socio-oeconomic pressures which would have caused persons to move. Covering a series of seven different mobility modes (ranging from non-migratory to near constant movement), the schema is then associated with a modern example before being related to recently published individual case studies (including Boscombe Down and the Nordic Bronze Age female remains from Egtved and Skrydstrup). In order to place these examples in context against the dynamism of the European Bronze Age landscape, the various forms of social and economic exchange and networking which have been posited as modes of contact within this period (i.e. marriage alliances and kinship circles, semi-mobile craftsmen and long- and short-distance trade) are also identified and discussed.

06 WERE WE WRONG? RECONSTRUCTIONS OF LIFE STRATEGIES OF THE CORDED WARE POPULATIONS FROM SOUTHERN POLAND

Author: Dr hab. Szczepanek, Anita - Institute of Archaeology and Ethnology, Polish Academy of Sciences; Jagiellonian University Medical College (Presenting author)
Co-Author: Dr Jarosz, Paweł - Institute of Archaeology, Adam Mickiewicz University in Poznań; Dr hab. Włodarczak, Piotr - Institute of Archaeology and Ethnology, Polish Academy of Sciences; Prof. Frei, Karin M. - The National Museum of Denmark; Dr Pospieszny, Łukasz - Institute of Archaeology and Ethnology, Polish Academy of Sciences; Dr Dopieralska, Jolanta - Adam Mickiewicz University in Poznań; Mgr Hozer, Monika - University of Rzeszów; Prof. dr hab Machnik, Jan - Polish Academy of Arts and Sciences; Mgr Mazurek, Mirosław - University of Rzeszów
Keywords: CWC culture, isotopes
Presentation Preference: Oral

Our study concerns the Corded Ware populations which occupied the southern Poland in the 3rd millennium BC. We studied two settlement regions, first near Cracow in the Little Poland, second near Rzeszów in the Subcarpathia. The distance between them is about 200 kilometers so the daily contacts were not possible. Both populations respected similar funeral behaviors. They buried their dead in niche graves with arrangement and equipment depended on their sex and age. Our task was to verify hypothesis about life strategies of these populations that were formulated in last 40 years basing solely on archaeological sources. By applying 87Sr/86Sr measurements we investigated the mobility of these people to identify potential migrants. The second part of our effort concentrated on diet reconstruction based on δ15N and δ13C stable isotopes analyses. Comparison of archeological and isotopic evidences enabled us to find significant similarities and differences within populations and between them. The project is currently realized (National Science Centre, Poland, NCN 2015/19/B/HS3/02149).

07 AT THE BEGINNING OF CHANGES. EARLY BRONZE AGE IN SOUTHERN POLAND IN THE LIGHT OF STABLE ISOTOPES ANALYSIS.

Author: Dr Jarosz, Paweł - Institute of Archaeology, Adam Mickiewicz University in Poznań (Presenting author)
Co-Author: Dr hab. Szczepanek, Anita - Institute of Archaeology and Ethnology Polish Academy of Sciences; Jagiellonian University Medical College; Dr hab. Włodarczak, Piotr - Institute of Archaeology and Ethnology Polish Academy of Sciences; Dr Dopieralska, Jolanta - Adam Mickiewicz University in Poznań; Mgr Mazurek, Mirosław - University of Rzeszów
Keywords: EBA, isotopes, Poland
Presentation Preference: Oral

The aim of the study is to present the process of cultural transformation of and social changes in the south-eastern Poland and western Ukraine in the late Neolithic and early Bronze Age, based on the stable isotopes analysis. The item of analysis are materials from settlements and necropolises associated with the early phases of the Mierzanowice culture (c. 2400/2300-2000 BC) within the areas in the upper basins of Vistula and Bug rivers. Conducted studies verify the hypothesis of gradual cultural changes taking place in the local communities. The final result of this process was a cultural transformation and the emergence of the Early Bronze Age groups. In this context it was important to establish the participation of local and non-local individuals in this process of changes. The results of stable carbon (δ13C) and nitrogen (δ15N) isotopes analyses allowed for paleodiet determination, while the analysis of stable isotopes of strontium (87Sr / 86Sr) enabled to reconstruct the migration processes and to restore interregional relations between the Mierzanowice culture communities.

08 LOCALS OR NON-LOCALS? PROVENANCING THE ORIGINS OF INDIVIDUALS BURIED IN EARLY MEDIEVAL CHAMBER GRAVES IN POLAND BY STABLE ISOTOPE ANALYSIS

Author: Dr Błaszczyk, Dariusz - Institute of Archaeology, University of Warsaw (Presenting author)
Keywords: isotopes, chamber graves
Presentation Preference: Oral

This paper presents the results of strontium, oxygen and carbon stable isotope analysis of individuals buried in so-called chamber graves from five archaeological sites. In medieval Poland these types of burials were constructed in the 10th and 11th centuries and contained interments of men, women, and children. Most scholars agree that they were places of final rest for members of social elites. The controversy is triggered by the ethnic affiliation of those people. Some archaeologist believe that individuals buried in chamber graves were non-locals, namely of Scandinavian origin. Others see them as representatives of local, Slavic population.
Using stable isotope analysis, I try to determine if individuals buried in chamber graves in Poland were of local or non-local origin and what it would mean in their case. I compare data obtained from isotope analysis with artefacts accompanying the dead and, when possible, with results of DNA analysis.

09 THE ARPADIAN AGE BURIALS OF OBERLEISERBERG (AT) - AN INTERDISCIPLINARY APPROACH

Author: Mag. Brundke, Nina - University of Vienna (Presenting author)
Keywords: Osteoarchaeology, Nutrition, Arpadian
Presentation Preference: Oral

The early medieval burial ground of Oberleiserberg is situated on a hilltop in Lower Austria and close to the Czech boarder. According to the grave goods the 79 excavated graves date back to the 10th and 11th century. The human remains as well as the grave goods and stray finds are analyzed as part of the international FWF-founded project „Frontier, Contact Zone or No Man's Land? The Morava-Thaya Region from the Early to the High Medieval Ages" (I1911 – G21, Project Leader: Stefan Eichert und Jiří Macháček).
Finds, including 35 Arpadian age coins, and 79 skeletons are analyzed interdisciplinary. Archaeological and anthropological methods as well as scientific examination are used to answer questions regarding nutrition, mortality, pathology, mobility, etc.
One of the first results of this interdisciplinary approach is the proof of an age related custom of choosing grave goods, representing the first evidence in East-Austria for the 10th and 11th century.
Along with archaeological and anthropological methods, isotopic analysis of the skeletons plays an important role in this study. Every individual will be examined in regard to nitrogen-carbon- and sulfur-isotopy. This will provide new information concerning nutrition of the population of Oberleiserberg.
The combination of archaeology, anthropology and isotopic analysis gives us the opportunity to find out more about the connection between nutrition and status, gender, and age as well as pathology and mortality.
Therefore the extensive interdisciplinary examination of this burial ground population provides new insights into the live of a population at the turn from Early to High Middle Ages in Central Europe - a contact zone between Ottonian, Arpadian and Přemyslid sphere of influence.

10 FIT FOR A KING? RECONSTRUCTING THE CATCHMENT FOR FEASTS AT IRON AGE NAVAN FORT, THE ROYAL CAPITAL OF ULSTER, IRELAND

Author: Dr Madgwick, Richard - Cardiff University (Presenting author)
Co-Author: Dr Grimes, Vaughan - Memorial University, Newfoundland; Dr Lamb, Angela - NERC Isotope Geosciences Laboratory, British Geological Survey; Dr Nederbragt, Alexandra - Cardiff University; Dr McCormick, Finbar - Queen's University Belfast
Keywords: Iron Age, Feasting
Presentation Preference: Oral

Iron Age Ireland is characterised by large ceremonial centres, which in later mythology were identified as the capitals of the ancient Irish provinces. These were not settlement sites, but rather gathering places that were only periodically populated. At Navan Fort, Ulster, a grand timber structure (40m diameter) and a large faunal assemblage dominated by pigs is indicative of feasting that must have involved large congregations. These feasts provide the best evidence for large gatherings in Iron Age Ireland. As such they were doubtless central to the development and maintenance of inter-community networks. Very little is known about the character of these networks and how feasts supported them. In the absence of human remains, fauna provide the best proxy for addressing this. This paper presents strontium (87Sr/86Sr) and sulphur (δ34S) isotope results for identifying non-local animals and, where possible, exploring origins, and carbon and nitrogen (δ13C/δ15N) isotope data for investigating husbandry regimes.

The feasts may have been insular affairs, designed to reify the identity of Ulster communities and consolidate the kingdom's surplus, by bringing animals to the ceremonial centre. Alternatively their role may have been in developing and maintaining inter-regional relations with bonds cemented through participants feasting on meat from different kingdoms. Animal husbandry can also provide insights into community interactions, as livestock may have been raised at a household level by feasting participants or by specialist producers enlisted by the elite. The findings have ramifications for understanding the dynamic interactions underlying society during the Irish Iron Age.

11 THE MESOLITHIC LADY OF AIZPEA: A MULTIDISCIPLINARY LIFE HISTORY APPROACH TO A NORTHERN IBERIAN INLAND HUNTER-GATHERER

Author: Fernandez-Crespo, Teresa - University of the Basque Country; University of Oxford
Co-Author: Ordoño, Javier - University of the Basque Country (Presenting author); Schulting, Rick - University of Oxford
Keywords: Isotopes, Life-History, Mesolithic
Presentation Preference: Oral

Isotopic approaches to Western European Mesolithic have traditionally focused on the Atlantic coastline, where shell-midden sites and burials are frequently documented, and especially on the marked shift from marine to terrestrial isotopic values coinciding with the Mesolithic-Neolithic transition in the region. Interior areas of the continent, however, have been barely explored due to both research interests and the scarcity of funerary sites, and littler is known about the lifeways of people that made use of very different landscapes and resources.

In this paper we explore the case of the Late Mesolithic (ca. 5600-5500 cal. BC) burial of Aizpea, in northern Spain, where a young adult woman was interred, the so-called 'Aizpea's Lady'. The aim of the study is to provide new insights into the life history of this individual. To this end, we use a combination of different approaches, including osteology, paleopathology, δ13C and δ15N isotope analysis of both bone collagen and tooth dentine, and trace elements. The fact that the burial was found in a layer containing a wide range of faunal and plant remains with clear signs of having been exploited (e.g. terrestrial herbivores, freshwater fish, birds, wild plant foods, which are included in the isotopic study) will be crucial to ascertain the variability of baseline isotopic signatures in the surrounding landscape.

The results confirm that this individual's subsistence mainly depended on the exploitation and consumption of inland resources during her life (with potential importance of plant foods) and not on marine resources, probably because the mobility of her community did not often include the coast, some 60km from the site.

12 ISOTOPIC DETERMINATION OF A NON-LOCAL BIRTHPLACE OF A WELL-KNOWN ROMAN SOLDIER FROM VELSEN, THE NETHERLANDS

Author: Doctor/Phd L Waters-Rist, Andrea - Faculty of Archaeology, Leiden University
Co-Author: Drs. Palmer, Jessica - Faculty of Archaeology, Leiden University (Presenting author)
Keywords: Isotopes, Provenience, Roman
Presentation Preference: Oral

In 1977 the skeleton of a young adult male was excavated from the bottom of a well from the Roman fort of Velsen, The Netherlands. His unique find context and pathological and traumatic lesions, which suggest high physical activity and possible perimortem violence, sparked much discussion. In particular, his local or non-local origin, possibly potentially being a Roman soldier, may have implications for his manner of death. A reanalysis of the skeleton including strontium (86Sr/87Sr) and stable oxygen (δ18O) isotope analyses has provided new data about his birthplace and childhood home. These isotope ratios vary with certain geological and environmental factors and their characterization for most of Europe permits a thorough base from which to assess the geographic homeland of this 'Velsen man'. Enamel samples from the first, second, and third molars were analyzed to capture tissue formed at different ages of infancy and childhood. Results indicate he was born in a coastal area of the Mediterranean, possibly the northern coast of Africa or the Aegean, or eastern Spain, Portugal, or southern France. We can definitively exclude The Netherlands (including Frisia), Belgium, northern France, central Europe (Germany, Czech Republic, Hungary, Austria, Slovenia, and Switzerland), central Italy, and the eastern Mediterranean as his birthplace and childhood home. He did not come to The Netherlands until adolescence or adulthood. Thus, 'Velsen man' was non-local, supporting the hypothesis that he was a Roman soldier who travelled to this remote outpost, possibly meeting a violent end.

13 THE LIFE, JOURNEYS AND TRAUMAS OF THE SLINGSHOT WOMAN: A CASE STUDY FROM PICA 8, NORTHERN CHILE

Author: Dr Santana-Sagredo, Francisca - CNRS (Presenting author)
Co-Author: Dr Retamal, Rodrigo - Universidad de Chile; Dr Schulting, Rick - University of Oxford; PhD(c) Pacheco, Aryel - Durham University; MSc Herrera, María José - Independent; PhD(c) Uribe, Mauricio - Universidad de Chile; Prof Lee-Thorp, Julia - University of Oxford
Keywords: Isotopes, Bioarchaeology, Atacama
Presentation Preference: Oral

Despite the extreme environmental conditions of Northern Chile's Atacama Desert this was not an impediment for travelling across it. In this paper, we present the case of a woman who moved from the high Andes to the Pica oasis in the lowlands (travelling more than 200 km) during the Late Intermediate Period (LIP, AD 900-1450). Before death she suffered two serious injuries, leading to a broken clavicle and fractured pelvis. Although these injuries show some healing, she died at an age of around 25-30 years old. Our aim is to characterise the life history of this individual who was buried in the Pica 8 cemetery, from an archaeological, bioanthropological and multi-isotopic perspective (δ13C, δ15N, δ18O and 87Sr/86Sr) on teeth, bone and hair samples. Results suggest she lived most of her life in the Andean altiplano consuming a terrestrial C3 based diet, probably including potatoes and quinoa. She moved to Pica during the last months of her life, showing a drastic change in her diet to consume mainly C4 foods, i.e., maize. Her burial offerings are quite unusual, with the presence of a slingshot that stands out among the other grave goods of Pica 8. This study is a first approach for understanding female mobility and lifeways in the Atacama Desert during the LIP.

14 TRACKING HUMAN MOBILITY IN THE SOUTHERN LEVANT DURING THE BRONZE AND IRON AGES

Author: Eshel, Tzilla - University of Haifa (Presenting author)
Co-Author: Tirosh, Ofir - Institute of Earth Sciences, Hebrew University of Jerusalem; Dr. Yahalom-Mack, Naama - Institute of Archaeology, Hebrew University of Jerusalem; Prof. Erel, Yigal - Institute of Earth Sciences, Hebrew University of Jerusalem
Keywords: Strontium, Enamel, Levant
Presentation Preference: Poster

Strontium isotope analysis represents an effective means of assessing mobility and reconstructing geographic residence patterns in archaeological populations.
As evidence concerning human mobility in the Southern Levant during the Bronze and Iron Ages, we present the results of strontium isotope and trace metal analyses of human tooth enamel and petrous bones of over 80 individuals from 10 different sites in the Southern Levant. We find that the majority of the human population displays 'local' 87 Sr/86 Sr values, however several individuals can be distinguished for their foreign origin. These results, combined with trace metal concentrations as indicators of pollution caused by the degree of industrialization are discussed.
Strontium isotope analysis studies for the Southern Levant are rare. The current results are an initial database, to be used as reference for future studies.

183 PREVENTIVE ARCHAEOLOGY TOWARD THE THIRD DECADE OF THE 21RST CENTURY

Theme: 2. The Valletta Convention: the next 25 years
Author: Demoule, Jean-Paul (France) - University of Paris I
Co-Author(s): Guermandi, Maria Pia (Italy) - Ministery of Culture
Keywords: Preventive archaeology Valetta Convention Quality
Presentation Preference: Round table

At the 22nd EAA Conference in Vilnius there were three related sessions on preventive archaeology, in which a large range of case studies was presented. Following that critical appraisal and the results of other meetings and publications (see EAC 2013-2015 and the Amersfoort Agenda), the round table seeks to analyze the main problems and challenges of preventive archaeology.
The cultural horizon, which, for a large majority of EU countries, had its political and legislative basis in the Malta Convention, has changed considerably over the last quarter of a century. After Faro Convention and the 2008 economic crisis, a massive redefinition of the areas of public intervention - including the institutions responsible for managing cultural heritage and the academic community - has been put in place. The relevance of our discipline seems greatly diminished and the practices of preventive archaeology across the territory have become more fragmentary and "bureaucratised" in many European countries.
While numerous problems of implementation and reconfiguration of the 1992 Malta Convention still remain, legal positions have actually been eroded. Moreover, in countries where archaeology is predominantly conceived as a commercial activity, the crisis has thrown numerous organisations into a cost-cutting spiral, with as a side effect, in many cases, the reduction ofstandards both in terms of employment conditions and of scientific production.

Our intention is to provide more general arguments and tools for thought to those seeking to promote, towards the third decade of the 21rst century, this challenging reconciliation of scientific, patrimonial and socio-economic aims.

01 LEAVING MALTA... OVER LAND?

Author: Mr. Barreiro, David - Institute of Heritage Sciences (Presenting author)
Co-Author: Ms Varela-Pousa, Rocio - Institute of Heritage Sciences
Keywords: Public Archaeology, Crisis
Presentation Preference: Oral

In the recent years there has been a clear attempt from most institutions across Europe to update the models of archaeological heritage management implemented following the Malta Convention. This is visible not only in the documents issued by advisory institutions (Council of Europe, EAC) but by the government institutions (European Comission and Parliament, Council of EU) which are reviewing its global policy on Cultural Heritage in several terms. All that can be related with the need of updating Malta Convention in order to make it more participatory, sustainable and integrated. But is it really so?
To our view the model on which the Malta Convention is based 1) has accentuated the division between professional sectors, 2) has had a very uneven utility for market regulation (very different from country to country) and 3) has by and large forgotten society (following a technocratic paradigm).
Despite the solutions that are being articulated from the institutions to supposedly change things, we argue that they do not imply a paradigm shift, but actually a deterioration of its contradictions: a real turn of screw. In most recent proposals for governance, sustainability and integration we can find, albeit embellished, the same problems that we have found in the "golden years" of the model.
The real question is not what model of archaeology, but what global context of the archaeology policies we need. The problem is that an integrated preventive archaeology, with the participation of different professionals, open to society as a whole, and sustainable (that is, a really public preventive archaeology) is not compatible with capitalism. We argue that any paradigm shift must be built as part of a transformative praxis, and that political action (both in archaeology and in its legal-administrative framework) should take most of our efforts in the future.

02 THE RISE, DECLINE AND FALL OF FRENCH PREVENTIVE ARCHAEOLOGY

Author: Doctor/Phd Depaepe, Pascal - Inrap; CNRS UMR 7194 (Presenting author)
Keywords: PreventiveArchaeology, Legislation
Presentation Preference: Oral

In France, preventive archaeology has experienced an amazing growth during the last thirty years. This increase, often at the initiative of the archaeologists themselves and poorly supported by the public authorities, has generated an extraordinary increase in the number of excavated sites, and therefore of the data made available to archaeologists. Moreover, preventive archaeology seems to have met a formidable echo among a large public, as shown by the successes of the operations of cultural valorisation.
However, French preventive archaeology seems to be at a turning point in its history. Large-scale development work is scarce, and the emergence of commercial competition has changed the way it operates. The question of the scientific and heritage management of these enormous amounts of data is also crucial.
This paper aims to lay the foundations for a debate around these different subjects.

190 CULTURAL HERITAGE POLITICS IN A TRANSITIONING EUROPE

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author: Phelps, Dana (United States) - Stanford University
Co-Author(s): Plets, Gertjan (Netherlands) - Utrecht University
Keywords: Heritage, Identity, Transnationalism, EU Integration
Presentation Preference: Round table

Amidst movements of people across and within Europe's borders, rising neo-nationalisms, and renewed ethno-religious violence in Eastern Europe, cultural heritage is actively solicited by national governments and international institutions to meet the acute challenges that a transitioning Europe now faces. However, the employment of cultural heritage to serve transnational goals including European identity formation through musealization and memorialization projects, UNESCO branding, or the restoration of historic buildings, brings in its own set of challenges. Intended or not, these heritage projects often fuel ethnic and religious conflict, marginalize minority communities, and erase painful histories that are necessary for collective reconciliation processes. Whether looking at heritage bureaucracies' capacity to shape (supra)national consciousness, the role of the European Union (EU) in forging collective European identities, the complexity of memory politics in relation to the refugee crisis, or the heritage rights for which minority communities contend as cultural diversity threatens the idea of an integrated Europe, critically examining heritage politics in contemporary Europe is a necessary albeit thorny endeavor.
This roundtable brings together scholars in the field of cultural heritage, all of whom have expertise across Europe that ranges in issues such as transnational memory and identity; historical erasure and heritage rights; memorialization of sites of controversy; representations of post-socialist heritage; heritage branding; and the cultural politics of EU integration. Discussing at a key moment in Europe's history, this roundtable seeks to actively contribute to a deepened understanding of the heritage issues that are most critical to Europe's present and future.

01 TRANSNATIONAL HERITAGE INVESTMENTS AND GLOBAL SECURITY AGENDAS IN A TRANSITIONING ALBANIA

Author: PhD Candidate Phelps, Dana - Stanford University (Presenting author)
Keywords: Heritage-diplomacy, Europeanization, global-security
Presentation Preference: Oral

The post-communist country of Albania is at a critical juncture in its history: poised for European Union (EU) integration on the one hand, it is lured by Turkish and Middle Eastern investments on the other. Based on two years of research in the EU candidate country of Albania in southeastern Europe, this paper explores the entanglement of transnational heritage investments in Albania coming from both its east and west. How does Turkey's neo-Ottoman project in Albania contradict Albania's desires to Europeanize? How might the EU's investment in Albania's cultural heritage conceal a need to protect EU borders and fight against threats to global security? In what ways does the United States' "soft"

approach to heritage diplomacy in Albania exploit and impact upon inter-religious tolerance in Albania? How does German investment in Albania's communist heritage connect to global security issues, and what are the potential conflicts in its approach? Through tracking foreign heritage investments in Albania and conducting in-depth interviews with its key players, this research seeks to demonstrate how transnational heritage investments push foreign agendas that impact upon Albania's social and material landscapes, inciting tensions in even the most unlikely of situations. Situated in a region that has long been exploited by foreign powers, Albania has yet again become the target landscape of international agendas, this time through the medium of cultural heritage. The ultimate aim of this presentation is to provoke a discussion on the benefits, contradictions, and experiences of heritage "diplomacy" in a transitioning Europe.

02 EU CULTURAL FUNDING IN EASTERN EUROPE: A EUROPEAN FAMILY?

Author: Dr. Niklasson, Elisabeth - Stanford University (Presenting author)
Keywords: Europeanization, archaeopolitics, heritage-funding
Presentation Preference: Oral

Ever since the preparations for eastward enlargement began in the 1990s, EU cultural politics has struggled with a crisis of diversity. In order to make room for new member states within the already established discourse of European belonging, based on Western high culture and 'European roots', had to be redefined. A few years into the new millennium, the idea of a common European past embodied in monuments and sites shifted to the notion of a reunited 'European family' sharing the same values. By focusing on the participation and outcomes of archaeological projects co-funded by the EU culture programs, my contribution to the discussion will address this East/West dynamic on a conceptual and practical level. It will provide examples of different challenges and incentives connected to EU funding for eastern partners, as well as some discursive strategies used to fit the archaeological content into the 'EUropean' frame.

03 HERITAGE FUTURES AND THE FUTURE OF HERITAGE

Author: Professor Dr Holtorf, Cornelius - Linnaeus University (Presenting author)
Keywords: Heritage Futures
Presentation Preference: Oral

In this short contribution I argue that the continuously expanding field of heritage is potentially more useful but also more harmful than ever. It is therefore imperative to deal more professionally with heritage futures and consider questions such as these: Which future are we working for? What do we know about this future? How is that future related to the impact of heritage practices in the present?

04 TRANSYLVANIAN SAXON HERITAGE: WHERE TO?

Author: Curator, Dr. Coltofean, Laura - Brukenthal National Museum, Sibiu, Romania (Presenting author)
Co-Author: Curator Munteanu, Alexandru-Ilie - Brukenthal National Museum, Sibiu, Romania
Keywords: Transylvania, Saxon, heritage
Presentation Preference: Oral

Transylvania, a historical region in the central part of today's Romania, is home to one of Europe's most neglected yet promising cultural landscapes: the Saxon villages. Settled in Transylvania beginning with the 12th century, Saxons founded towns and villages which are landmarks in the region, and an inseparable part of its colourful identity. Eight centuries later, Saxons became victims of the communist regime which, towards its end, sought to systematically uproot ethnic minorities. Consequently, most Saxons abandoned their homes and moved to Germany already during communism, but especially after its fall in 1989. Almost thirty years later, Saxon villages are, with few exceptions, merely a shadow of the thriving rural communities they once were. The houses and medieval, fortified churches are in a severe process of degradation. In many cases, they are illegally inhabited by Roma who are unaware of the importance of this heritage and contribute to its destruction. The Romanian State does not seem to be interested in preserving Saxon heritage. In addition to this, many Saxons living in Germany believe their history is too painful and prefer to forget it. They seem to have renounced their identity and heritage rights. There are some initiatives for the revival of these cultural landscapes, both local and foreign, but their impact is generally weak. Saxon heritage will be slowly erased, unless coherent heritage protection strategies are implemented. This situation might be a threat for the heritage of other ethnic minorities living in Romania, especially in the context of the nationalist ideology promoted by the newly elected government. This paper discusses the current state of Saxon rural heritage, from its preservation to the threats it faces, and its tourism potential. It presents and analyses examples of successful and unsuccessful restoration projects, heritage management and engagement strategies.

191 RETHINKING THOMSEN'S THREE AGE SYSTEM: CRITICAL INTERROGATIONS OF THE EPISTEMOLOGIES SURROUNDING THE "IRON AGE"

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Balco, William (United States) - University of North Georgia
Co-Author(s): Johnson, James (Denmark) - University of Copenhagen
Keywords: Iron Age, Epistemology,
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Few concepts have proven as durable, if not commonsensical, as C. J. Thomsen's three-age system. Thomsen constructed a chronology not based on the cultural typologies so common in the late 19th century, but rather on observations that there were distinct technological achievements through time. This system has endured many changes and challenges within the various fields of archaeology, undergoing further refinement through chronological and cultural phasing (early, late, Hallstatt, La Tene, etc.). Today we continue to use the term and concept of 'Iron Age' as a moniker to indicate the presence of, and subsequently classify, meaningful differences from what came before and after.

This session aims to unpack the last stage of Thomsen's three-age system. We challenge our participants to critically interrogate what the Iron Age means ontologically as well as epistemologically. Should the Iron Age continue to be taken as a priori or at times a posteriori to characterize regions at particular moments or periods of time? We seek engagements with the Iron Age concept that examine the dynamic material, spatial, and temporal conditions of what it might have meant to live in the Iron Age. We encourage

participants to explore more reconciliatory approaches between the different 'archaeologies' employed to investigate the Iron Age, in particular how settlement and mortuary archaeologies might be used in tandem. Ultimately, the goal of this session is to outline investigative lenses through which interrogation and comparison might be used to unpack the Iron Age concept to make it more inclusive than exclusive.

01 CONTEXTUALIZING IRON AGE IDENTITY IN WESTERN SICILY

Author: Dr. Balco, William - University of North Georgia (Presenting author)
Keywords: Iron Age, Sicily
Presentation Preference: Oral

During the first half of the first millennium BC, western Sicily was the site of intense social transformation following the arrival of Greek colonists, Phoenician merchants, and the movement of various indigenous populations within Sicily. Colonial and indigenous culture intersected both socially and economically, resulting in initial contact and sustained interaction. This phenomenon introduced new forms of social organization and expanded economic networks, transforming identities by blurring the lines between indigenous, colonized, and colonizer. This paper will first review historical and archaeological evidence of Iron Age Western Sicilian identity and chronology. Next, the transformation of indigenous material culture is explored as a proxy for broader social change. Finally, this paper challenges the established convention of what constituted Iron Age western Sicilian identity, proposing that Iron Age identities in western Sicily developed and transformed differentially and semi-autonomously as a result of local developmental trajectories.

02 LOST IN TRANSITION? QUESTIONING SUB-DIVISIONS OF THE DUTCH IRON AGE (C.800-50 BC)

Author: MA de Roest, Karla - University of Groningen (Presenting author)
Keywords: Periods, Burials, Netherlands
Presentation Preference: Oral

In the still widely used handbook The prehistory of the Netherlands (Louwe Kooijmans et al. 2005), burial rites of the Middle and Late Iron Age (c.500-50 BC) are indicated by question marks (Hessing and Kooi 2005, 634-635) because the normative burial is largely invisible during that period. Therefore, it is not clear when changes were sufficient to speak of a new type, making it difficult to periodize. Nevertheless, the period is divided into an Early, Middle and Late stage. This division is thus based upon scarce evidence, furthermore hindered by the Hallstatt-plateau. This paradox raises the question whether the differentiation reflects real observations in the archaeological record, or is imposed upon it as an existing framework. The funerary choices do not necessarily correspond with chronology and show no clear break.

Moreover, it seems that in this region 'change' is less the result of technological transitions (the backbone of Thompsen's system) and more the outcome of complex societal interaction based upon ever-changing shared cognition. Burial rites were complex and functioned at multiple levels, as can be demonstrated by examining change and continuity. Variables ranging from groups and interregional contacts to individuals and local characteristics played an important role in the execution of graves.
This paper challenges the usefulness of the sub-divisions of the Dutch Iron Age, posing that the imposed framework does not reflect real notable changes in the burial record and should be revised (or abandoned?) in order to reflect archaeological reality. One could argue these terms should be kept as a 'hollow' name, indicating a period. One could also argue that a culturally loaded denomination would suit the region more. This is up for debate.

03 IRON AGE MACEDONIA: A "BUFFER-ZONE" BETWEEN ANCIENT GREEK HISTORY AND CONTEMPORARY ARCHAEOLOGIES.

Author: PhD Candidate Theodoroudi, Eleftheria - AUTH (Presenting author)
Co-Author: Prof. Kotsakis, Kostas - AUTH
Keywords: Iron Age Macedonia
Presentation Preference: Oral

Archaeological research in the Iron Age of Greece has always approached the North (Macedonia) with a certain uneasiness. For one thing, the North did not easily conform with the stereotypic narratives of the Greek past, presenting an individual culture, not fitting to the sophisitcated frame developped for classical archaeology. As a consequence, archaeologists working in the area were not in a position to fully incorporate this record to the chronological systems of Southern Greece (proto-geometric, geometric,etc), nor to the ones of the northern parts of the Balkan Peninsula and Central Europe (Hallastatt, La-Tène). They tried instead to interpret material traces of the past using methodological tools borrowed mainly from historiography, which nevertheless says little about the region and era.
In these research circumstances, Iron Age Macedonia was constructed in opposition to Southern Greece. This alterity was articulated through different research trajectories and was expressed subtly by the negotiation of a Macedonian identity both in the past and the present. With this paper, we will try to highlight the different perspectives and trajectories as well as the historical framework in which the archaeological research landscape of Iron Age Macedonia was constructed. We will also discuss the potentials and the limits the interdisciplinary approaches could provide to the understanding of the temporal and spatial features of Iron Age Macedonia.

04 THE CONCEPT OF THE "IRON AGE" IN JAPANESE ARCHAEOLOGY

Author: Ass. Prof. Wakabayashi, Kunihiko - Doshisha University Hitorical Museum (Presenting author)
Keywords: JapaneseArchaeology IronAge KofunSociety
Presentation Preference: Oral

In Japanese archeology, we have not used Thomsen's three age system or other term which is common around the world. The Japanese prehistoric cultural divisions on Holocene stage after Paleolithic culture are Jomon, Yayoi and Kofun society. A traditional Neolithic element of the polished stone tools with pottery has developed with hunting and gathering complex culture, Jomon culture, and the appearance of bronze ware and ironware seems to be at almost same age, BC 3rd century. Regarding as the big change of the cultural stage classification, the appearance of settled rice agricultural society, Yayoi culture, was BC 10th century. The complete ironware stage, Kofun society not based on stone tools, was established in the AD 3rd century. This stage has been regarded as complex chiefdom or early state society with many big mounded tombs.
The remarkable changes in society and culture were not related to the technological appearance of instruments, but were correlated with changes in how the artifacts were handled in social situation. This point seems interesting to think about what is the Iron Age. In the Japanese archipelago, the established iron-based society is thought to have been brought about by the increase in long distance trade and the correlation between the conversions with the production and consumption system of commodity, rather than

the improvement of metal technology. To think about what is Iron Age, the author would like to present an example of the Japanese archeology on the concept of the transformation process to established Iron Age.
Then the author will also discuss about the strength and the problem of this concept based on local cultural diversity.

196 MERC FORUM

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author: Hansen, Gitte (Norway) - University of Bergen
Co-Author(s): Fleming, Robin (United States) - Boston CollegePredovnik, Katja (Slovenia) - University of Lubljana
Keywords: medieval archaeology past and future
Presentation Preference: This is a proposal for the MERC Forum. We would like to organise the session as a workshop/roundtable. The aim is discussion about Medieval Archaeology: the last and the next 20 years. We will invite a number of speakers, we have not yet settled the details. But we will either go for geographical coverage or thematic coverage. We would like to have a quarter day 'slot' for the session.

MERC
Medieval Europe Research Community

This is a proposal for the MERC Forum. We would like to organise the session as a workshop/roundtable. The aim is discussion about Medieval Archaeology: the last and the next 20 years. We will invite a number of speakers, we have not yet settled the details. But we will either go for geographical coverage or thematic coverage.

200 CRAFT: RECONSIDERING SOCIAL CONTEXT, PRODUCTION AND DIVISION IN PREHISTORIC AND NON-LITERATE SOCIETIES

Theme: 6. Interpreting the archaeological record
Author: Adams, Sophia (United Kingdom) - University of Bristol
Co-Author(s): Vajanto, Krista (Finland) - Nanomicroscopy Center Aalto UniversityRammo, Riina (Estonia) - University of Tartu
Keywords: cross-craft, production, skills, social context
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Archaeological research into craft and production tends to define different crafts based on the material of the final artefact: bronze, textile, ceramic and so on. This session provides an opportunity to compare the evidence across these divisions to explore alternative ways in which labour, production and technology might have been classified in the past. It will bring together researchers who study archaeological, experimental, scientific and anthropological evidence for production in prehistoric and non-literate societies, to develop a more holistic view of the social context of craft.
The potter had the skills to make a clay mould, the metalworker could model beeswax, the carpenter could carve the wooden template for the bronze axe. Multiple skills and the ability to manipulate different materials were needed to create the final products in any medium. Production may have been categorised by the requirement for fire and intense heat as opposed to cold working or modelling. Distinctions may have been drawn between the transformations of soft or hard materials. Craftwork may have been divided by the purpose of the product such as food related items or those connected with warming and protecting the body. Where skills and places of production are shared can we differentiate whether the evidence is cross-craft skill sharing or collaboration or do they indicate alternative skill divisions? Were many craft persons working together or just a single multi-skilled person? Were sequential seasonal activities associated with individuals or groups? How might we recognise the work of the same persons in different materials?

01 THE SOCIAL CONTEXT OF THE CERAMIC REMAINS OF NON-FERROUS METALWORKING

Author: Dr Adams, Sophia - University of Bristol (Presenting author)
Keywords: metalworking, context, ceramics
Presentation Preference: Oral

Research into the archaeological evidence for non-ferrous metalworking in later prehistoric Britain has shown that refractory ceramics (moulds and crucibles) dominate over metallic remains (such as casting waste) in settlement contexts. This paper examines the context of these ceramics. The evidence is derived from c.150 Bronze Age sites and c.220 Iron Age sites providing a substantial dataset from which to explore the social context of craft production during this period. In the Bronze Age the settlement evidence is dominated by clay mould fragments while in the Iron Age, crucibles, typically in fragments, form the greater part of the assemblages.

This paper explores the chronological changes in the evidence and questions how site specific changes in the distribution of refractory ceramics reflect shifts in behaviour related to craft production. Issues raised include variation in the association of refractory ceramics and occupation and food preparation activity; patterns in the association of non-ferrous production debris and remains from making objects in other materials such as antler and bone; and associations with other hot and cold production processes. By exploring this evidence it may be possible to reconstruct the level of connection between different production processes and reconstruct the social context of these technologies.

02 OF A MASTERY OF FIRE: ENGAGING WITH THE PRODUCTION OF LATE IRON AGE/EARLY ROMANO BRITISH BLACK BURNISHED WARE.

Author: Dr Wilkes, Eileen - Bournemouth University
Co-Author: Mr Trim, Phillip - Bournemouth University (Presenting author); Dr Pitman, Derek - Bournemouth University
Keywords: ceramic experimental archaeology
Presentation Preference: Oral

This paper explores how a knowledge of fire affects the ceramic production process, specifically how atmospheric manipulation helps produce the distinct colour of 'South East Dorset Black Burnished Ware' (SEDBB1). SEDBB1 is found throughout Roman Britain and northern Europe and its production is centred on Poole Harbour, on the south coast of England. Its manufacture spans the late Iron Age and Roman occupation, suggesting the industry survived significant changes in wider socio-political organisation. During this

period, Poole Harbour and its hinterland played host to numerous craft activities including metalworking, shale working and salt production all of which rely on aspects of the others within the wider production sequence. It therefore represents an ideal locale for exploring the relationship between crafts. Additionally, there are direct technological links between aspects of metallurgy and ceramic production. Atmospheric manipulation is a central concern within both crafts and there are clear parallels between reductive metallurgy and the reducing atmosphere required to produce SEDBB1. However, it has been traditionally studied as a discrete craft. The work outlined in this paper aimed to explore the process experimentally and experientially to better understand the role of the craft practitioner in the firing process as well as to offer a direct engagement with the materials and technical architecture used in the production of SEDBB1. This allowed both the technical requirements of the firing and the practical realities of producing a suitable atmosphere to be explored within their temporal context. This has a significant impact on how possible kiln structures within the archaeological record are interpreted and how ceramic production may relate to other crafts.

03 METALWORKING: IT'S ALL ABOUT THE MODEL.

Author: Dr Kuijpers, Maikel - Leiden University (Presenting author)
Keywords: metalworking, skill, moulds
Presentation Preference: Oral

Metalworking emphasises the use of metal. This is indeed the material in which the final object is cast. However, it is not the material in which the shape of the object is determined. This happens in the mould that is usually made of clay or stone in the case of simple shapes. More complex objects were likely made first as a model from beeswax or wood. In this presentation I explore the importance of the mould and the model in the creation of a metal object. From this questions arise about the role of the metalworker, our categorisation of crafts, and whether multiple people were involved in the process. For the latter some tentative evidence is given in the form of detailed chaîne opératoires of Early Bronze Age axes.

04 CRAFT-MAN IN TRANSYLVANIAN LATE BRONZE AGE MINING-PRODUCTION-TRADE

Author: Doctor/Phd Wittenberger, Mihai - National History Museum of Transylvania (Presenting author)
Keywords: bronze, organization, power
Presentation Preference: Oral

Craft-man in Transylvanian Late Bronze Age
mining-production-trade
abstract
Mihai Wittenberger, PhD
The work of e front intends to submit, in a form, the economic logic in the bronze age, from mining through to the distribution of artifacts. Transylvania as part of the Carpathian region, is a particular area because of its exceptional geographical situation, being surrounded from all sides of the Carpathian Mountains, a very rich and hydrographical network, not the last, being located midway between the Aegean Sea and the North Sea. Also exceptional mineral resources are: copper, gold, salt. To all this add the human quality and experience in the production of metal artifacts. I wish to point out the link between natural, economic, these production processes. As far as we now, was a mining occupation marked by sacred items, which shall be maintained in secret and only be conveyed within the community of the miners. Similarly, specialised metallurgists had settlements, for example Bolduț, Jud. Cluj, where very few people virtually lived, but molten ore furnaces abounded. The next cycle was craft-mans, which turned into bronze cake finished artifacts for sale. They had, it seems, specialized, permanent settlements or seasonal (Pălatca, Jud. Cluj). From them, the tracks reached merchants, although it is likely that merchants may have traveled along with the city. The last idea is supported by the many discoveries along commercial roads, major rivers in Transylvania, playing the role of the real freeways of the bronze age. This circuit, naturally to my mind, it had, however, maintained through a stable, social organization, administrative and military power. I think that, after analising the links between these elements, we can get an idea about how to operate a company that caused a real revolution in bronze metallurgy.

05 BOWL FOOD: A CULINARY PERSPECTIVE ON THE INTRODUCTION AND ESTABLISHMENT OF POTTERY IN EARLY NEOLITHIC BRITAIN

Author: Dr Sibbesson, Emilie - Canterbury Christ Church University (Presenting author)
Keywords: pottery, cooking, Neolithic
Presentation Preference: Oral

Stylistic and chronological approaches have dominated the study of prehistoric pottery for over a century. However, such studies isolate the manufacture and distribution of pottery from its use. In this paper I suggest that these separate strands of archaeological enquiry can be re-integrated by thinking of pottery as culinary equipment. This approach brings together the social contexts of potting and cooking. By drawing on evidence from (1) traditional 'hand-held' ceramic analysis of fabric and form and (2) organic residue analysis of cooking traces, I apply this approach to the introduction and establishment of pottery in Early Neolithic Britain. I argue that pottery was almost exclusively a food technology in the Early Neolithic, and as such a co-consideration of potting and cooking can be mutually informative. Organic residue studies of ceramics sometimes take aspects like pottery forms into account, but I suggest that the ceramic evidence can be taken further; details such as fabric, size, and surface treatment can also shed light on the intended use of pottery vessels. Therefore, this approach yields insights into the deliberate interplay between potters and cooks. This in turn sheds new light on the incorporation of pottery as a key food technology as indigenous groups adopted new ways of life and migrant groups established their traditions in new places.

06 MANY MASTERS, ONE GOAL – HIGH SKILLS OF MIGRATION PERIOD SNARTEMO TABLET WOVEN BANDS FROM NORWAY

Author: PhD Vajanto, Krista - Nanomicroscopy Center Aalto University (Presenting author)
Keywords: tablet weaving, crafts
Presentation Preference: Oral

This presentation discusses an on-going project to reconstruct Snartemo II and V bands, found in southern Norway and dated to Migration period. The structure of the table woven bands has long been under a debate, not because of the preservation of the textile that is usually the main problem when making interpretations of the patterns, but because

the patterns are so complicate. Nowadays it takes 1 hour by a very skilled weaver to weave 10 centimetre of Snartemo V band – and it is still unsure, if the pattern has been solved throughout.
If we look at the materials more closely, we can see, that in addition to the weaving, also in spinning, fibre processing and dyeing are of high quality. This suggests, that we are observing a product created by a group of skilled crafts people. For example, the yarns are 0.5 millimetre in diameter, but plied. A thread was spun from ca. 15 fibres – a feature that is hard to achieve unless the spinner is really skilled. The visible dyes are blueish, reddish and yellowish, which suggests that at least two dyeing techniques were used. The dyeing was performed so perfectly, that the fine, thin yarns do not show felting. Or perhaps there were some very special kind of fibre material available, that was not felting at all and was produced for this kind of luxury textiles only?
What was needed from the social network that set the rules and target for the craft persons, that they were able to create these luxury textiles? We suggest, that to evaluate the role of collaboration, experimental archaeology is a convenient and useful tool to explore processes and information sharing of crafts.

07 TRACING ANCIENT CRAFT IDENTITIES THROUGH TECHNOLOGICAL CHOICES AND TECHNICAL BEHAVIOURS: THE COPPER AGE POTTERY PRODUCTION OF CENTRAL ITALY

Author: Dr Forte, Vanessa - McDonald Institute for Archaeological Research (Presenting author)
Keywords: Pottery CopperAge Technology
Presentation Preference: Oral

This contribution focuses on the Copper Age pottery production of central Italy and its social inferences. The preliminary observations about practical skills and technical knowledge subject of this contribution emerge from a research project (TraCTUs- Tracing European Copper Age social dynamics through pottery Technology and Use) focusing on craft specialisation. The Copper Age represents a crucial period in human history, during which the first forms of social complexity begin to develop. In particular, in the current Rome area (Italy), subject of this work, numerous prehistoric clues, dated between the 4th and 3rd millennium BC, suggest the existence of social inequalities principally observed in funerary contexts.
Usually in order to investigate the organisation of production and craft activities, scholars elaborated various models based on a scale of intensity leading to interpret prehistoric pottery production as a household activity typical of egalitarian contexts. These models derive often from a limited empirical dataset and are principally based on ethnographic data and an evolutionary perspective; This contribution aims to highlight the potentials of exploring prehistoric craft activity through the specialisation concept, applying a methodological approach integrating social theories, diffused in Anglo-American studies, with a detailed empirical investigation performed through a multi-analytical study of direct and indirect evidences related to the organization of pottery production.
A context as the current Rome area provided well preserved ceramic materials from settlements and burial contexts investigated though a multi-analytical approach of compositional analyses of ceramic pastes, manufacturing traces analysis and experimental archaeology, all aiming to reconstruct technological choices and technical behaviours of the Copper Age artisans and contribute to the debate on their social identity.

08 TOWARDS TRACING SIGNS OF LABOR DIVISION AND CRAFT SPECIALIZATION IN THE SICILIAN BRONZE AGE TEXTILE TECHNOLOGY

Author: Żebrowska, Katarzyna - Institute of Archaeology, University of Warsaw (Presenting author)
Keywords: craft, specialization, textile
Presentation Preference: Oral

Textile tools, loom weights and spindle whorls made mostly of clay, are the unique source of information about the technology of textile production in Bronze Age Sicily (ca. 2200-850 BC). In spite of being a common find within any prehistoric excavation conducted on the island, they have never stated subject of a detailed study. The "Sicilian Textile Tools from the Bronze Age: Examination of Finds and Comparative Studies on Their Functionality" project was created to fulfill the existing informational gap and investigate Bronze Age Sicily's textile tools and technology in order to examine the development of textile craft over time. The research combines two methodological approaches: the methodology of archaeological research (which focuses e.g. on investigating the context of the finds) and the methodologies of textile archaeology (which concentrate on the specific category of archaeological finds that are textile tools, and on the experimental approach to those implements, discover functional, technological, and social aspect of those artifacts). Apart from providing a typological framework of the implements and analyzing their functional parameters, the project tackles problems of craft specialization, standardization, and organization of labor.
This paper presents the preliminary research in aim to assess whether the gathered material can answer questions proposed in the project regarding labor division and craft specialization in the Sicilian Bronze Age textile production: Can the typology of textile tools reflect specialization and/or standardization of textile implements? Can the spatial distribution of textile tools indicate that the craft specialization existed at that time? Can it point to any existence of labor division in the prehistoric Sicilian textile production or prove that textile production was centralized and/or that the manufacture was conducted exclusively within the framework of domestic production?

09 HOW TO DESCRIBE THE NATURE OF CRAFT? DIVERSE VS. SPECIALIZED ACTIVITIES AND THERE INFLUENCE ON SOCIAL CLASSIFICATIONS OF CRAFTSMEN

Author: Dr. Nessel, Bianka - Heidelberg University (Presenting author)
Keywords: specialisation, diversity, Europe
Presentation Preference: Oral

Differentiation and division of various craft sectors have been given high priorities during the last 100 years of Bronze Age research. This was necessary to determine what characterised different crafts and how significant these might have been in society. Positivistic argumentation was oftentimes used to draw certain conclusions and to develop a division between various craft branches. However, these somewhat rigorous divisions have also distracted our view from the diversity of craftsmanship and it´s working processes.
I aim to illustrate on the basis of selected examples from Central and South Eastern Europe north of the Aegean that only very few crafts are characterised by specialized activities, which can be exclusive allocated to them. However, cross crafting interaction, as described by A. Brysbert for the Aegean region, can in many cases also not be established. The majority of all craft processes are based on multi-dimensional and multi-applied actions, which can be clearly demonstrated by analysis of features and tools. This raises questions about the nature of craft specialization in the Bronze Age, since this high diversity seems to contradict established concepts.

10 UNDERSTANDING 'CERAMIC IDENTITY' THROUGH ANALYSIS OF MANUFACTURE AND CONSUMPTION OF IRON AGE CERAMICS FROM BULGARIAN THRACE

Author: Hart, Ashlee - University at Buffalo, SUNY (Presenting author)
Keywords: Technological Choice, Thrace
Presentation Preference: Oral

Archaeologists utilize ethnographic studies, scientific testing, and experimental archaeology to understand material manufacturing processes of the past. The manufacture and consumption of material goods in the past was conducted with the influence of societal, group, and individual ideas. The chaîne opératoire of ceramic manufacturing involves technological and stylistic choices that are reflective of these ideas or associations, which means that ceramics represent elements of human ideology. Ceramics are planned, created, and used based on societal ideology, but in themselves they have meaning that is understood through the study of craft production. The material fabric, manufacture process, and consumption practices leave marks within the story of ceramics. This process will be termed 'ceramic identity.' Ceramics, then, have the potential to be impacted by different cultural interactions and the arrival of new materials and ideas in a region over time. Changes in the 'ceramic identity' may occur as the result of such cross-cultural interactions.
The purpose of this presentation will be to examine changes in the 'ceramic identity' from the eastern Mediterranean. The region of ancient Bulgarian Thrace presents an ideal location to study such changes because the non-literate indigenous Thracian population during the Late Iron Age experienced the height of Greek colonialism and Hellenism. This presentation offers a preliminary evaluation of ceramics analyzed from an inland emporium site in southwestern Bulgaria examined during two successive field seasons. The results show both trends of continuity, as well as change in the material culture, which must be further analyzed.

11 THE CRAFT OF PREHISTORIC CAULDRON MAKING: A CASE STUDY FROM CHISELDON IN SOUTHERN ENGLAND

Author: Dr JOY, Jody - University of Cambridge (Presenting author)
Keywords: Cauldron, Craft, Prehistory
Presentation Preference: Oral

Cauldrons are complicated objects made from many different components. A recent discovery from the village of Chiseldon in southern England, where 17 complete Iron Age cauldrons were discovered in a single pit, provides an unprecedented opportunity to examine their manufacture in detail and to compare multiple contemporary vessels. The cauldrons have iron rims and handles with bowls made of copper alloy. Scientific examination has revealed many details about their manufacture including iron rims which have been quenched and sophisticated copper alloy sheet working. Hammer marks and marking out lines are also preserved in the surface of the copper alloy. The use of other materials in the manufacturing process is also evident, such as the presence of the remains of thin wooden stems which helped form the shape of apparently hollow rims, and the manufacture of formers, possibly made of wood or resin, to create raised decoration on at least three of the vessels.

It is possible to see several groups of cauldrons based on their rims and profiles but none of the vessels are identical. The number of repairs undertaken when they were made also indicates that their manufacture was not a standardised process, suggesting that the craft workers who made them were not specialist cauldron makers. Nevertheless, the skills of the people who made these vessels are clear and the objects raise many questions which will be addressed in this presentation. For instance, did individuals or groups possess all the necessary skills required to make the cauldrons, or was wider cooperation required? Did they work seasonally or full time, and is it possible to recognise the work of the same individuals in the different materials used to make the cauldrons?

12 ANALYSING MATERIALS AND MEANING IN LATE IRON AGE ARTEFACTS FROM BRITAIN

Author: Dr Davis, Mary - Freelance (Presenting author)
Keywords: copper alloy, glass
Presentation Preference: Oral

This paper will examine some aspects of the manufacture and use of copper alloy objects, plus that of glass and enamel. It can be seen that there are strong associations between the manufacture of objects and the use of material, style, colour and tradition over a large and diverse area of Britain during the first century AD.
The paper will look at brief case studies to illustrate this connectivity:

- Examination of the Chaîne opératoire evident for the manufacture of decorated bronze objects from the Polden Hill hoard.
- Examination of colour and style on decorated copper alloy artefacts from England, Wales and Scotland.
- How glass and metal working were potentially integrated at the LIA site of Culduthel in north east Scotland.
- How the style and selection of materials contributes to the manufacture of inlaid copper alloy objects.

13 THE PROCESS OF HALLSTATTIZATION THE SOUTH-WESTERN PART OF POLAND FROM THE VIEWPONIT OF THE CERAMIC MANUFACTURE RESEARCH

Author: Laciak, Dagmara - Adam Mickiewicz University in Poznań (Presenting author)
Keywords: hallstattization, provenience studies
Presentation Preference: Oral

The aim of the paper is to present results of the project which focuses on investigating the phenomenon of acculturation, involving the adoption of selected elements associated with the Hallstatt Culture on the territory of south-western Poland. The main intention was the correlation of selected features of ceramic objects and contexts in which occurred to the social and cultural changes that have took place in the Early Iron Age. The introduction of the so-called Hallstatt style led to significant changes seen in ceramic manufac-

ture including the organization of a potter's workshop. New forms of veseels, designs elements, technology were different from those locally practiced, which were common in the earlier period that is at the end of the Bronze Age.
The results of archeometry analyses of pottery (preceded by formal analysis) will be presented. They will be focused on recognizing methods of forming vessels, recipes of ceramic masses in order to make comparisons between these categories of ceramics within the same sites and from different regions of Poland and Czech Republic. Also an attempt will be made to determine their provienience by the juxtaposition of raw ceramic materials with analysed vessels.
A series of radiocarbon dates from different sites will determine the temporary range of functioning ceramics, which representing a diagnostic element of chronology established on the basis of formal analyses.
The scale of reception Hallstatt Culture elements in south-western Poland visible in manufacturing ceramic will be determinated: what was the nature of emerging phenomenon, is it characterized by innovation, how they affect the society of those time?
The information collected will be analyzed and interpreted using social theories. This will contribute to a complementary approach of ceramic manufacture what makes the project interdisciplinary research.

14 A NEW CRAFT: SALT-SPRING EXPLOITATION. PREHISTORIC PRODUCTION OF "SALT CAKES" IN EASTERN ROMANIA

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Keywords: Briquetage, craft, Eneolithic
Presentation Preference: Oral

Archaeological research has captured in the area of Eastern Romania a diachronic evolution with respect to the exploitation of salt by the prehistoric and, in particular, Eneolithic communities. The clustering of settlements around the salt springs reveals an understanding of the multiple valences of salt, reflected by an intense use. The archaeological investigations, as well as the ethnoarchaeological ones, have furthermore highlighted a certain degree of specialisation in the exploitation of salt springs by the communities from this area rich in salt (the Subcarpathian area). Can we say, therefore, that this activity was a craft? The present paper aims to demonstrate this.
The specificity of the Eneolithic agrarian communities with characteristic activities, such as animal husbandry and inter- and intra-community trade, required the manufacturing of a finite product from the saline water, in solid form, compact, quantifiable, and easy to transport.
To the complex chain of briquetage production were added the specialised activities of obtaining the so-called salt cakes, of consistent size and weight. The required aptitudes, the technological know-how and the careful selecting of certain categories of raw materials used in the technological process, argue for assigning the activity of salt-spring exploitation among the crafts. The obtained product, just like other artisanal objects (made of bone, ceramics, bronze, iron, glass, leather, wood etc.), not necessarily from Eneolithic, held a certain position, both economic, of a practical character, and social, in terms of symbolic load.

15 MAKING SPIRAL TUBE DECORATIONS – A NEED FOR COLLABORATION AND SHARED KNOWLEDGE

Author: Ms Rammo, Riina - University of Tartu; Aalto University (Presenting author)
Co-Author: Mrs Ratas, Jaana - University of Tartu Viljandi Culture Academy
Keywords: craft, textiles
Presentation Preference: Oral

Adorning clothing with spiral tube decorations made of copper alloy and yarn was common in the Late Iron Age (ca. 800-1225 AD in Estonian context) in Eastern Baltic. The production of such adornments might need skills, knowledge, and collaboration of several persons: (1) person for processing metal, (2) spinster (and dyer) for fine yarns, and (3) maker of patterns. Maybe sometimes a middleman / trader between those artisans was acting as well. On the basis of finds, some of the adornments are clearly homemade, but at least partly these fine items were meant for trade and represent specialised craft.
A birch bark box from the beginning of the 13th century might belong to a person producing also spiral tube decorations on highly skilled level. The box contained yarn, horse hair, tools (e.g. tablets for weaving), prefabricated products (ringlets, spiral tubes, beads), bundles of woollen ribbons, and rolls of several ready-made, but not finished bands made of spiral tubes. In addition, items indicating more to trade activities, such as scales, imported textiles (e.g. brocaded silk), and small-scale jewellery (e.g. pendants, rings), were found. Who was the owner of the box? How was (s)he involved in the production of spiral tube decorations? Did (s)he had (and on what extent) knowledge about properties of copper alloys, wool preparation, and trading? How much is it possible to trace collaboration between various craft persons?

16 IRON AGE 'ARTISTS'? CONSIDERING THE EVIDENCE FOR AN EARLY CELTIC ART DESIGN SKILLSET

Author: Dr Chittock, Helen - University of Oxford (Presenting author)
Keywords: Celtic Art, design
Presentation Preference: Oral

Early Celtic Art is the name given to the style of swirling decoration found on a wide range of objects from Iron Age Europe: jewellery, weapons and vessels, mainly made from bronze or gold. The precarious status of the notion of prehistoric 'art', and the lack of named Early Celtic Art practitioners mean that the people who created these designs are not considered 'artists', and have remained anonymous and elusive. I argue, however, that by considering the specific set of skills needed to design and produce the patterns that make up Early Celtic Art, we can move closer to understanding who may have made these objects and how they fitted into the wider world of Iron Age craft.

This paper will look in detail at a sample of Early Celtic Art objects from Britain to identify evidence for two different types of skill: the skill of creating designs that fitted into the style using a specific lexicon of motifs, and the skill of executing these designs using tools and techniques. These two skillsets came together in the production of Early Celtic Art objects, whose functional forms and patterns cannot easily be separated.

Both these processes required highly specialised skills that not everyone in Iron Age Britain possessed. I will argue, however, that whilst designing Early Celtic Art objects required a very specific knowledge of the correct motifs, the production process utilised cross-craft skills and pulled in multiple craftspeople and materials. This paradox between an esoteric design process and a collaborative production process will form the basis for discussion, as I use the evidence to try and envisage the overlapping communities of practice from which Early Celtic Art objects emerged.

17 PAINTING AMARA WEST: COLOUR TASKSCAPES IN ANCIENT SUDAN

Author: Ms Fulcher, Kate - UCL Insititute of Archaeology; British Museum, Department of Scientific Research (Presenting author)
Keywords: paint, pigment, Egypt
Presentation Preference: Oral

The ancient Egyptians decorated their houses using bright colours, and archaeological evidence suggests this was not just the prerogative of the elite. My research takes as its starting point the material evidence for the production and use of paint at the ancient Egyptian/Nubian town of Amara West. Scientific analysis of the pigments and binders on palettes and walls has identified the raw materials used, which was used to inform an experiential study in which I recreated the paints from raw materials. During this process the range of materials and skills required to create paint, from gathering the raw materials to application on the wall, became apparent. To manufacture paint the minerals had to be collected from a known location, stone tools created from local materials, a paintbrush prepared using plant fibres, plant gum collected, and ceramic palettes obtained. Only then could the technological process begin. In addition, more than one colour was generally used, and some were difficult to obtain, so trading relationships had to be negotiated. It appears unlikely that there was a dedicated painting profession within the town, meaning that every household undertook their own painting tasks; these skills were widely shared within in the ancient town's population. Within each step of the painting process social norms and practices would come to bear, requiring certain actions or performances. The apparently simple act of painting a wall is revealed to be an involved and lengthy social process with many practitioners.

18 THE FINE GREY WARE PYXIS: EVIDENCE FOR A LOCALIZED CROSSOVER?

Author: Professor Miller Bonney, Emily - CSU Fullerton (Presenting author)
Keywords: pottery, crossover
Presentation Preference: Oral

Bronze Age Cretan pottery stands out for its generally painterly and plastic characteristics, From the Early Bronze Age through the Late Bronze Age Cretan finewares featured painted designs apparently often intended for display at competitive feasting events. Painted design and shape were integrated visual productions that could be enhanced by applied flowers and figurines whether human or other animals or by the inclusion of orderly ridges and protrusions that emphasized the structure of the vase. While incision appeared on some of final Neolithic pottery occasionally in combination with white filling the more subtle decoration presumably was less appropriate for pottery intended to make a visual statement. Thus the appearance of a class of globular vessels in a distinctive grey fabric decorated solely with complex incised designs at the transition from Early Bronze I to Early Bronze II is surprising. Fine Grey ware was produced only in south central Crete although the specific location(s) remains unknown. The ware is distinguished by its unique firing conditions. While fine grey ware plates and chalices were known in the Early Bronze age the globular pots usually called pyxides are new at the beginning of the EB II and mark a distinctive development with decoration that imitates works in metal, basketry and leather and differs from contemporary painted wares. This paper argues that these vessels although clearly outstanding works of pottery evidence craft crossover at a critical point in the EB with the appearance of the first substantial settlements in the are of production. The intersection of the craft crossover at a time of significant change suggests that one way to understand such borrowings is as a means by which social transformation occurred. That is that the pottery was one of the ways through which new social groups emerged.

19 METHODS OF THE RIMS SHAPING FROM DUBOVY LOH 5 NEOLITHIC SITE (SOUTH-EASTERN BELARUS): COMMON FEATURES AND SPECIAL ASPECTS

Author: Ms Tkachova, Maryia - Institute of History NAS of Belarus (Presenting author)
Keywords: pottery, Neolithic, Belarus
Presentation Preference: Poster

The archaeological settlement Dubovy Loh 5 is located on the right bank of the Ipuc river (the left tributary of the Soż river) near the old lake, in 3 km to south of the village Dubovy Loh. In 1979, 1981-1983 A. Kalechyts excavated there an area of 612 square meters. As a result 1988 potsherds from more than 190 vessels of the Neolithic period were found. Considering the vessel itself as the result of the potter's work, we can single out the stable traditions of making ceramics. In addition, the method of vessel constructing reflects the level of development of potter's production skills.

The study of the rims of 73 vessels made it possible to determine several methods of their constructing at the site. The most popular technique is the so-called "simple" design of the rim. The thickness of the edge of such rims is equal to the thickness of the walls of the entire pot. Such technological methods as deliberate thinning or thickening of the rim are rare. In some cases, the fibrous material was used to form the edge of the vessel for additional strengthening the rim. This method indicates a more developed technique for forming the edge of the pot, which is necessary when creating large wide-necked vessels. The use of this technique indicates a profound master's knowledge of clay properties and a high level of his practical skills. It remains an open question whether the deep ornamentation of the rim edge had a technological character or performed only a decorative function.

Thus, throughout the entire Neolithic, the shape of the upper part of the vessels from the Dubovy Loh 5 site remained unchanged. Only at later part of Neolithic there was a new tradition of designing the upper part of the vessel

20 STUDYING MULTIPLE TECHNOLOGIES: CASE STUDIES FROM THE NEOLITHIC OF SE EUROPE

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Co-Author: Dr. Antonović, Dragana - Institute of Archaeology, Belgrade
Keywords: bone industry, lithics
Presentation Preference: Oral

Archaeological studies of technology and craft production are often limited to one type of raw material – lithic, ceramic, and so on. Even one group of raw materials, which clearly represents one technology, with shared manufacturing techniques and forms, is sometimes split into smaller groups (for example, mollusc shells are sometimes studied separately from other osseous raw materials, or obsidian is separated from other chipped stone tools). However, for comprehensive study of technology and craft production in prehistory it is necessary to study relations between different technologies – they may share same tools, activity areas, craftspersons; changes in one technology influence the changes in others, etc.

The introduction of the Neolithic way of life brought also new tools, new tasks and new technologies. In this paper, we will explore the relations in production between bone and stone artefacts in the Neolithic. Not only stone tools were used for production of bone objects and bone retouching tools were involved in stone production, but we may also note the connection in technological changes (e.g., increased use of abrasion in bone technology with the increased number of stone whetstones), examples of skeuomorphism

(similar or identical forms in different materials) and so on. Furthermore, we tried to examine the relations of tools made from bone and stone used for the same or related tasks: for woodworking, plant processing, etc.

21 NINEVEH'S FIRST POTTERS - A SCIENTIFIC STUDY OF HASSUNA POTTERY FROM MALLOWAN'S DEEP SOUNDING

Author: Dr Spataro, Michela - The British Museum (Presenting author)
Co-Author: Dr Fletcher, Alexandra - The British Museum
Keywords: technology, Neolithic, Iraq
Presentation Preference: Oral

The British Museum collection includes over 300 sherds of Hassuna pottery found at Nineveh, Mosul, Iraq, in the early 20th century, during fieldwork led by L. King and R. Campbell Thomson on behalf of the BM. These sherds are mainly from a stratified sequence in the 'Prehistoric Pit', dug by Max Mallowan in 1931-32. Mallowan (1933) was the first to recognise Hassuna pottery as a distinct phenomenon, which was soon recognised across northern Mesopotamia. Nishiaki and Le Mière (2005) have analysed Hassuna pottery from Tell Seker al-Aheimar. Using macroscopic methods, Petrova (2012) has studied Hassuna technology at Yarim Tepe I. These studies, and contemporaneous pottery at Tell Sabi Abyad (Nieuwenhuyse 2006), hint at a dramatic change in the chaîne opératoire at c. 6000 BC, when local variants were rapidly replaced by a common technical tradition. As technological similarities and differences should reflect the sources of pottery as a craft (chaîne opératoire transmitted between generations), scientific analyses of the Nineveh material will show whether this tradition is extended to the Tigris, or if superficially similar pottery was made following local traditions.
The results of the analyses by thin-section petrography and SEM-EDX of 60 sherds from the lowest layers of Mallowan's Prehistoric Pit will be discussed, focusing on 4 key steps (raw material procurement, clay preparation, construction and firing) in the production of prehistoric pottery. Linked to the shapes and styles of vessels sampled, the results will define the pottery chaîne opératoire over a significant period. Focus will be on how the creation of objects requires special skills/knowledge, what these say about social relationships between makers and owners, and how the treatment/decoration of different materials enables new ways of thinking and social relationships.

22 THE ELKS OF ŠVENTOJI: TAKING ANOTHER CLOSER LOOK

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Co-Author: Iršenas, Marius - Vilnius Academy of Arts, Institute of Art Research; Prof. Dr. Butrimas, Adomas - Vilnius Academy of Arts, Institute of Art Research; PhD student Rimkus, Tomas - Klaipeda University (Presenting author)
Keywords: Elk, Baltic area
Presentation Preference: Oral

The staffs featuring heads of elks are a characteristic Stone Age artefact coming from the Baltic Region. The skilfully carved staffs uncovered in the Stone Age settlements of Šventoji have received a comprehensive coverage and discussion in archaeological literature, nevertheless, the investigation continues. In 2016, a microscope of 960-times enlarging capacity was used to the use-wear analysis of the elk-head staffs from the Stone Age Šventoji settlement; one of the staffs was dated using the radiocarbon method. The report discusses the results of these investigations and the new discoveries that extend the knowledge about the crafting technology of these artefacts and provide new information for further considerations regarding the purpose and function of these staffs.

23 FIGURATIVE SHELL, STONE, AND BONE WORK IN THE PRE-COLONIAL CARIBBEAN: PERSPECTIVES ON CROSS-MATERIAL TECHNOLOGY

Author: Breukel, Thomas - Leiden University (Presenting author)
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Keywords: Technology, Microwear, Cross-craft,
Presentation Preference: Oral

Indigenous Caribbean figurative objects of shell, stone, and bone are rich in imagery, and research has traditionally focussed on interpreting iconographic depictions and representations. Their symbolism is linked to socio-political developments, in which powerful individuals commissioned craftsmen and demonstrated ritual capacities by engaging the carved symbolisms on these materials. Aspects of use and exchange have come under investigation only recently, however, and little is known about manufacturing strategies in this context. These materials have dissimilar physical and structural properties, each of which enabling different production strategies and prevent the enactment of others. This paper seeks to understand how engagement with the variety of materials aligns in the manufacturing process, and how Caribbean figurative objects interrelate on technological terms. Microwear traces on materials from various late pre-colonial sites (AD 1200-1500) have been analysed using Optical Microscopy leading to a reconstruction of the operational sequences. Differences exist in overcoming morphological constraints during early reduction, and in the use of certain tools adapted to the specific working of shell, stone, and bone materials. Nevertheless, their manufacturing processes are based upon conceptual steps shared across media.

24 THE ROLE OF ARCHAEOMETALLOGRAPHY IN INTERPRETATION OF ANCIENT BLACKSMITH'S ARTEFACTS

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Co-Author: Dr. Terekhova, Nataliya - Institute of Archaeology Russian Academy of Sciences (Presenting author)
Keywords: archaeometallography, blacksmith's craft
Presentation Preference: Oral

Method of archaeological metallography is the main one on studying of the problems of ancient metallurgy and metalworking. The interpretation of metal structure lies on the basis of archeometallographic method. Our research group working in the Institute of Archaeology of the Russian Academy of Sciences carries out the systematic investigation of ancient iron artifacts. As a result the unique bank of metallographic data including more than 13000 analyzes was created.
Generalization of the analytical data allowed the authors to reconstruct the history of the development of ironworking in Eastern Europe. It was established that becoming of ironworking took place long chronological period of the late 8th c. BC – 8th c. AD. The different kinds of steel, carburization and heat treatment were learned at this time. Cardinal changes in the East European smithing craft occur at the turn of the 1st and 2nd millennia AD. They are associated with the formation of urban craft, connecting to craft differentiation . The basis of smithing craft became various options of welding technologies at this time.
Special importance is the problems related to the mechanisms of tradition formation and their interaction with innovations. To consider the raised problem we turn to the spectacular materials obtained from the medieval sites of Ancient Rus'. As we have established on the archaeometallographic data the Russian ironworking based on interaction two

traditions: in one case Scandinavian, in another – Slavic. Scandinavian technological impulse associated with three-fold welding technology. The Slavic technological tradition based on using welding-on schemes. The introduction of the Scandinavian tradition followed an explosion-like model, but it had not any substantial effect on the further development of the Russian ironworking. Slavic-Russian technological tradition spread gradually and turned to be much stable.

25 CRAFTING A POST-ORIENTALISING WORLD: TEXTILE PRODUCTION AND SOCIAL DYNAMICS IN SOUTHWESTERN IBERIA IN THE LATE 6TH-5TH CENTURY BC

Author: Dr Marin-Aguilera, Beatriz - McDonald Institute for Archaeological Research, University of Cambridge (Presenting author)
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Keywords: textile economy, Iberia
Presentation Preference: Oral

The role of textile craft and production has been often neglected in favour of other economic activities such as pottery making or metallurgy. However, textile production implies a long and complex 'chaîne opératoire' in which many and diverse artisans –potters, carpenters, metalworkers, and textile specialists–; materials –linen, wood, textile tools, etc.–; and techniques –spinning, weaving, and dyeing– are actively involved. Since the very beginning of the process, textile production requires solid planning and collaboration among different members of the community, from farmers and shepherds, to spinners and weavers, plus metalworkers and merchants. Textile production and consumption are thus a fruitful venue to explore sequential activities associated both to groups and individual persons. The study of textile manufacture assists us in gaining a better understanding of the social and economic dynamics of craft production and consumption in prehistoric and pre-industrial societies. In this paper, we would like to focus particularly on the 'chaîne opératoire' of textile production in southwestern Iberia in the late 6th-5th century BC.

26 THE INTEGRATION OF CRAFTING SPACES: A PERSPECTIVE FROM THE BRONZE AGE AEGEAN

Author: Dr Jeffra, Caroline - University of Amsterdam (Presenting author)
Keywords: workshops, Bronze Age
Presentation Preference: Oral

The Bronze Age was a time of deepening craft knowledge, and excavations at sites around the Aegean have revealed 'artisan's quarters' and 'workshops', so identified thanks to the presence and prevalence of crafting materials, tools, and/or specialized architectural features. This discussion will focus on the ways that these areas are embedded in their contexts, exploring the extent to which craft activity was rooted in the everyday social landscape of people based on the archaeological evidence. From this, a few key questions arise: What potential was there for craftspeople to be visible to one another in their everyday activities and tasks? Were crafts equally high-visibility activities for all people at these sites? Are crafting areas well- or poorly-integrated into domestic and public spaces? Are there spatial divisions between crafts which produce different kinds of material culture? Tackling these questions – which situate craftspeople in their workspaces as well as within their communities – can lead to a better understanding of the integration of crafting spaces into social landscapes, while perhaps highlighting the potential interconnections between craftspeople working to produce items belonging to different material classes.

27 MADE WORLDS: A HOLISTIC APPROACH TO MAKING AND DWELLING IN IRON AGE BRITAIN

Author: Dr Farley, Julia - British Museum (Presenting author)
Keywords: objects, making, process
Presentation Preference: Oral

Archaeological material culture is traditionally studied by specialists in particular materials such as pottery, stone or metalwork, and published in material-specific sections in site reports. This is often a necessary stage in the analysis of assemblages, but it effectively divorces finished objects from the complex web of cross-craft interactions which produced them, and also from other aspects of the inhabited landscapes and architecture of Iron Age communities, such as landscape divisions, structures and earthworks. Settlements were not merely back-drops to activity, but 'made worlds', created and constantly transformed by knowledgeable actors working with the affordances of their local resource-rich (or impoverished) landscapes.

This paper takes a process-focused, craft-based approach, using the site of Staple Howe (in North Yorkshire, UK) as a case study. Focusing on processes and production rather than static artefacts, this paper will present this hilltop settlement as a 'made world' formed by the interactions of humans, animals, and the environment. It asks:

- What processes, skills, and resources went into creating the material culture, structures and landscape interventions evidenced at the site?
- How can a process-based approach extrapolate beyond the direct archaeological evidence to consider human/animal/environmental interactions through the year?
- How can this inform wider discussions of social organisation?

Inferences from material culture and environmental archaeology will be used to consider relationships between society and environment. Discussion will focus on craft processes, the agricultural cycle, seasonal availability of resources, longer term management of woodlands etc., local exploitation of varied materials and landscape zones (e.g. pasture, forest, wetlands), as well as trade-routes and access to wider social networks.

Overall, the paper seeks to use material culture to give a deeper understanding of the lived experience of ancient communities by investigating the relationship between craft production and social organisation, and how 'making' shapes lives, experiences, and landscapes.

203 THE ARCHAEOBOTANY OF NON-FOOD PLANT EXPLOITATION

Theme: 6. Interpreting the archaeological record
Author: Mooney, Dawn Elise (Norway) - University of Stavanger
Co-Author(s): Pinta, Elie (France) - Université de Paris 1 Panthéon-SorbonneGuðmundsdóttir, Lísabet (Iceland) - Fornleifastofnun Íslands
Keywords: Archaeobotany, Non-Food Plants, Human-Environment Interactions
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

There has existed to some extent within archaeology a tacit dichotomy between the examination of plant foods and of vegetation dynamics, conducted by archaeobotanists and palaeoenvironmental scholars, and the investigation of plant-based artefacts, conducted by artefact specialists. This session proposes that this separation precludes a holistic understanding of plant exploitation by past human populations. While plants make an undeniably vital contribution to diet across the globe, non-food plant materials were also of crucial importance to past human communities. Plants provide fuel for various purposes, and plant materials have been widely used for construction and crafts, from buildings and modes of transportation to household objects and furnishings. Plants are also used in the production of textiles, cordage and pigments, and in medicinal and ritual practices. This session explores how scientific approaches can elucidate the use of plants in non-food contexts, and how this information can be used to investigate human-environment interactions in the past. Approaches might include plant macrofossil analysis, wood anatomical investigations, dendrochronology, genetic studies, and analysis of plant micro-fossils. Of particular interest is how these methods can be used to explore human selection of plants for particular craft, medicinal and ritual purposes, and what this can tell us about the availability of plant taxa within the landscape and temporal and spatial variations in plant exploitation at various scales. We invite contributions from a variety of time periods and regions, to develop a dialogue around the potential of scientific methods to bridge the divide between 'traditional' archaeobotany and artefact studies.

01 FROM THE ARTEFACT TO THE TREE: WOOD AND WOODWORKERS IN MEDIEVAL NORSE GREENLAND

Author: PINTA, Elie - Université Paris 1 Panthéon-Sorbonne; CNRS - UMR 8096 Archéologie des Amériques (Presenting author)
Keywords: Archaeobotany Greenland Norse
Presentation Preference: Oral

Used in construction and boat building, for domestic productions or as a fuel resource, wood was a key material for medieval North European societies. For people living in Medieval Scandinavia, tree and timber were common in both landscapes and mythology and therefore were an essential cultural item. Several studies have been conducted on the topic of wood use in Scandinavia, the British Isles and the North Atlantic islands, and all demonstrate the wide variety of objects that can be unearthed when preservation conditions are good.
The goal of this paper is to present recent research on the identification of wood species (both local and imported) used by the inhabitants of Greenland. An analysis of wood use along a climatic margin such as Greenland will help us understand and retrace the origin and circulation of wood resources in the Norse settlements. What was the nature of Norse Greenland society woodworking strategies and management ? Is this process best understood in terms of cultural dynamics or adaptive strategies when compared to other case studies from the Norse world?
The methodology goes beyond the traditional approach of classifying artifacts using typo-technology by also applying methods of wood anatomy and dendrology. Together, these approaches provide a fuller understanding of the wood artifact production sequence employed by Norse craftsmen, as well as the relationship between Greenland and the other North Atlantic islands.

02 WOOD UTILISATION DURING THE CHRISTIANIZATION OF ICELAND IN THE 11TH CENTURY

Author: Guðmundsdóttir, Lísabet - Institute of Archaeology Iceland (Presenting author)
Keywords: Wood, Christianization, Church
Presentation Preference: Oral

Iceland was Christianized in the late 10th century or early in the 11th century. The process was relatively fast and it has been proposed that a church, and a home cemetery, was constructed at every third farm or so. Archaeological investigations have revealed that the first churches were wooden stave constructed buildings with earth dug posts. The general belief has been that these buildings were built from imported material. Wood samples from six church sites were anatomically identified to reveal where Icelandic church farmers got timber for both churches and coffins. These results were then compared to the written sources, for example the Icelandic sagas, law books and other medieval texts. The written sources suggest that timber for these early churches were imported, in most instances from Norway but also from Suðureyjar (The Hebrides), England and Sweden. The anatomical wood identifications from these sites reveal a different story. Due to low species diversity of the native woodland it is possible to establish whether the wooden remains are imported, native or driftwood. The churches from these six sites were constructed from various conifer species, which are not native to Iceland, and birch. The coffins were constructed from the same wood species as the churches but also from imported wood. The 11th century church farmers did not depend on imported wood but could acquire it through other means for example from driftwood and native wood.

03 SEVERAL WOODS FOR SEVERAL USES. EXPLOITATION AND SELECTION OF FOREST RESOURCES AT THE PILE-DWELLING CAVE "SETTLEMENT" OF GROTTE DI PERTOSA

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Keywords: Pile-dwelling, wood exploitation
Presentation Preference: Oral

Grotte di Pertosa is a natural karst cave located on the northeastern slopes of the Alburni Mountains in Campania (Southern Italy). This cave housed a pile-dwelling settlement during the Middle and Late Bronze Age. A peculiar aspect of this archaeological site is the preservation of the protohistoric wooden structures thanks to the waters of the underground stream flowing in the cave.
The most impressive evidence comprises the floors of two different pile-dwelling levels, which were first excavated in the late nineteenth century by Patroni and Carucci. These scholars published data concerning both the structures and the wooden artifacts discovered. Therefore, in this paper, a review of the inferred archaeobotanical data from their studies is provided.
Fortunately, several wooden poles have been preserved in the riverbed area; they are still accessible and represent the main subject of this work. So far 86 poles, still deeply driven into the riverbed, have been identified and registered.
Microscopic wood analysis has been conducted on 46 samples taken from as many poles during the 2009-2013 research campaigns; furthermore 20 wood samples of uncertain attribution, found in a rich organic material layer, have also been analyzed as well as charcoal preserved in the same archaeological stratum.
A first result from this study is related to paleoenvironmental issues. The comparison between the archaeobotanical assemblages and the modern surrounding vegetation, in light of the paleoclimatic data available in the literature, allowed us to elaborate on a preliminary paleoenvironmental reconstruction and to speculate about the catchment areas of wood exploited. The archaeobotanical study provided also information about wood used for different purposes: building material, fuel and craft-activities.

04 A SCOTTISH IRON AGE WETLAND VILLAGE BUILT FROM NATURE'S BOUNTY: UNDERSTANDING THE FORMATION OF PLANT LITTER FLOORS.

Author: Miss Robertson, Jackaline - AOC Archaeology Group
Co-Author: Mrs Roy, Lynne - AOC Archaeology Group (Presenting author)
Keywords: Floor-layers, Archaeobotonay, Micromorphology
Presentation Preference: Oral

The on-going excavation at Black Loch of Myrton in south-west Scotland has revealed the existence of an Iron Age wetland village. To date, three structures have been excavated and a large macroplant assemblage preserved through both waterlogging and charring has been recovered from a wide range of contexts. By employing a multi-proxy approach it has been possible to more fully understand the vital role of plant resources in the construction and maintenance of both the internal and external floors. The sampling strategy involved collecting standard bulk samples and a series of monoliths and thin-section samples. The monoliths were excavated in laboratory conditions and the identified stratigraphically distinct layers within each context were gently teased apart as an aid to understanding how the plant remains were originally deposited. Sub-samples for determination of Loss on Ignition and pH analyses were also taken from within the identified layers.

The combined macroplant and micromorphological analyses have allowed us to identify which plant materials were deliberately selected to form the distinct floor layers, how they were deposited, the frequency with which the floors were cleaned and resurfaced and the post-depositional processes to which they were subjected. Analysis of the sample sequence at both the macro- and micro-scale indicates that deliberate deposition of fresh plant materials followed by subsequent trampling acted as the primary depositional process. The macroplant assemblage recovered from this site indicates that the selection of plant materials was clearly influenced by what was both locally and seasonally available.

05 INDUSTRY, CRAFT OR AGRICULTURE? EXPLORING THE POTENTIAL USES OF SEAWEED IN THE NORSE NORTH ATLANTIC

Author: Dr Mooney, Dawn Elise - University of Stavanger (Presenting author)
Keywords: Seaweed, Metalworking, Norse
Presentation Preference: Oral

Seaweed forms an important element of diet in many parts of the world and has a wide variety of other uses due to its high mineral content. However, seaweed remains have only rarely been found in archaeological contexts, and its use in the past in northern Europe is little understood. Over the past two decades, charred remains of seaweed, especially Ascophyllum nodosum and Fucus vesiculosus, have been recovered from excavations of sites in Norway, Scotland and Iceland dated from the Iron Age to the Early Medieval period. These finds have been identified both in bulk environmental samples and in soil micromorphological slides. At some locations charred seaweed appears to be associated with industry, such as the ironworking sites of Vatnsfjörður and Alþingisreiturinn in Iceland, and the silversmithing site of Sømme in southwestern Norway. At others, however, the presence of charred seaweed is less clearly associated with industry, and has been variously interpreted as being used in the preservation of food, in mineral licks for livestock, and in the production of lye for use in the dyeing of wool. Furthermore, ethnohistoric evidence from Brittany, France documents burnt seaweed being used as fertiliser in arable fields, and seaweed ash is also known to have been historically used in glass manufacture. This presentation examines how archaeologists can recover, recognise and interpret charred seaweed remains from archaeological sites, with a particular focus on the connection of these finds with metalworking activity at the sites of Lækjargata and Vatnsfjörður in Iceland, and Sømme in Norway.

06 PTERIDIUM AQUILINUM (L.) KUHN (BRACKEN) AND ASSOCIATED PLANTS AS A PACKING MEDIUM: THE PEWSEY HOARD AND OTHER UNUSUAL EXAMPLES

Author: Dr Pelling, Ruth - Historic England (Presenting author)
Co-Author: Dr Grant, Michael - University of Southampton
Keywords: Bracken, metal corrosion
Presentation Preference: Oral

Pteridium aquilinum (bracken) is one of the most widespread of all plant species, found in every continent except Antarctica (Marrs and Watt 2006). While it is regarded as a problem in terms of landscape conservation, this has been linked to a decline in its use for a myriad of purposes including packing, bedding, roofing, and compositing. Past use tends to be inferred rather than demonstrable, although a number of definitive examples do exist (Campbell and Pelling 2013).
The recent examination of remarkable plant material preserved by metal corrosion products from a late Roman bronze vessel hoard found in the Vale of Pewsey, UK, provids a clear example of use of bracken as a packing medium. The assemblage, coupled with a study of pollen preserved upon the hoard surfaces, produced a range of other incorporated taxa and background vegetation information, likely time of year of the burial, and evidence for the movement of the hoard from its packing location to its burial location. The mixed plant assemblage also provides evidence that the collection of bracken will often incorporate several unexpected plant types. The evidence of the Pewsey Hoard will be presented along with further examples of bracken preserved by metal corrosion products used as packing material for both hoards and burials. The paper will stress the value of involving relevant specialists at an early stage, and the importance of engraining plant evidence from metal finds within the archaeobotanical consciousness.

Campbell, G, and Pelling R 2013 'The palaeoethnobotany of Pteridium aquilinum (bracken): myriad past and present uses from documentary evidence and the archaeobotanical record' 6th Conference of the Internation Workgroup for Palaeoethnobotany, Thessaloniki, 17- 22 June 2013. http://iwgp-2013.web.auth.gr/images/Posters/campbell%20and%20pelling.pdf
Marrs R H, and Watt, A S 2006 'Biological Flora of the British Isles: Pteridium aquilinum (L.) Kuhn.' Journal of Ecology 94, 12 72-1321

07 THE USE OF EVERGREEN PLANTS FOR RITUAL AND ORNAMENTAL PURPOSES IN ROMAN BRITAIN

Author: Dr Lodwick, Lisa - University of Reading (Presenting author)
Keywords: Roman, Archaeobotany, Ritual
Presentation Preference: Oral

The introduction of a wide range of plant foods to the north-western Roman world has received much research focus since the turn of the century. However, introduced plants were also utilised for ornamental and ritual purposes, including box, stone pine and norway spruce. Archaeobotanical evidence for these plants often resides in the blurred area between plant artefacts and palaeoenvironmental records. Pine cones are often recorded as artefacts, and interpreted within the framework of ritual deposition. In contrast, occasional finds of box leaves from taphonomically complex on-site waterlogged deposits are interpreted as indicators for local vegetation, but past relationships between humans and box shrubs are not considered.

A dataset of plant macrofossils from Roman Britain has been collated, demonstrating the presence of box, stone pine, norway spruce and plane within Roman towns, military forts, burials, villas and other rural settlements. Archaeobotanical evidence for these evergreen plants will be considered from both a taphonomic and contextual perspective, to ascertain to what extent these plant remains indicate the presence of ornamental plants, or the use of imported plant objects in ritual activities. The cultivation of ornamental plants, and the use of stone pine in ritual activities, will then be considered on both spatial and chronological scales in Roman Britain. Artefactual and artistic evidence for the role of these plants in the Roman world will be evaluated, before a plant materiality approach is used to consider how plants 'acted upon' humans in these settings, and affected sensory and temporal experiences of places in Roman Britain.

08 NETTLE, HEMP AND FLAX: CHALLENGES AND PROSPECTS FOR IDENTIFYING ARCHAEOLOGICAL PLANT FIBRES

Author: Mr Waudby, Denis - University of Bradford (Presenting author)
Co-Author: Dr Thompson, Jillian - University of Bradford; Dr Evans, Adian - University of |Bradford
Keywords: Plant-fibre: diagnosis, morphology
Presentation Preference: Oral

.A range of natural fibres is likely to have been used for textiles and cordage in the prehistoric material culture of Northern Europe. Three significant sources are thought to have been nettle (Urtica dioica L.), flax (Linum usitatissimum L.) and hemp (Cannabis sativa L.). These plants favour different growth conditions, require different levels of husbandry and their products undergo different processing methods. However, their fibres share some physical and material properties which make them difficult to distinguish in the archaeological record.

This paper evaluates the techniques conventionally applied to differentiate between these fibres, and presents some interim results on alternative approaches to identifying unknown modern and archaeological specimens. The intention is to review the diagnostic potential of (1) the geometric morphology of the fibres' cross sectional area, (2) their fibrillar rotational-velocity and (3) the presence of phytoliths, as robust and minimally invasive techniques which may aid the interpretation of ethnographic and archaeological textiles. Ethnohistoric accounts from North America, Siberia and Scandinavia will also be discussed, to highlight technical aspects of textile production, and the social and cultural practices used to enhance and exploit wild, tended and cultivated plant resources.

09 THE PRODUCTION AND USE OF CORDAGE IN THE BALEARIC BRONZE AGE: THE COVA DES PAS (FERRERIES, MENORCA)

Author: ROMERO, SUSAGNA - Universitat Autònoma de Barcelona (UAB) (Presenting author)
Co-Author: Dra PIQUÉ, RAQUEL - Universtitat Autònoma de Barcelona (UAB); Dr PICORNELL-GELABERT, LLORENÇ - ArqueUIB Research Group; Dr CALVO, MANUEL - ArqueUIB Research Group
Keywords: cordage, vegetal fibers
Presentation Preference: Oral

The study of fiber remains in the Mediterranean area is limited due to the scarce contexts where organic material has been preserved. However, the late Bronze Age burial context of Cova des Pas (Ferreries, Menorca, 1200-800 cal BC) has provided an extraordinary assemblage of well-preserved plant remains, abundant cordage among them. The aim of this work is to present the current research regarding the production and use of cords at this archaeological site.
The presentation will be focused on the methodology and the first preliminary results of the study. Our objective is the characterization of the items through the production process, paying attention to the morphological and technical characteristics of the whole assemblage. We have identified several categories according to technical features. Moreover, plant fiber has been identified by comparing their anatomical features with modern reference collections. Finally, it has been possible to develop hypotheses about the use of ropes according to the technology of production and in relation to contextual objects, especially shrouds wrapping the dead bodies and wooden biers used to transport them to the burial cave. The analysis of more than 600 remains show a certain variation regarding size, direction of twist or type of ropes. The majority of cords are twisted and only few remains correspond to braided cords. According to the results, we will provide information about plant resource management, in relation to past environments, as well as cordage use among the Balearic Bronze Age societies.

10 IS CHOICE ACCEPTABLE? HOW ANTHRACOLOGICAL PARADIGMS MAY HINDER THE CONSIDERATION OF FUEL GATHERING AS A CULTURAL BEHAVIOR.

Author: Delhon, Claire - Université Côte d'Azur; CNRS; CEPAM (Presenting author)
Keywords: anthracology, fuel selection
Presentation Preference: Oral

Charcoal analysis is a powerful and well-established means of documenting past environments and ancient societies' impact on vegetation. Thanks to seminal works constantly reinforced since the 1980s, the palaeoecological accuracy of anthracological spectra built from scattered charcoal derived from long-term use of domestic fuel is widely acknowledged. This broadly accepted paradigm relies on the hypothesis that firewood gathering is done following the Least Effort Principle, in areas frequented for routine activities, and may include any species encountered there. After repeated fires, charcoal spectra provide an accurate picture of the woody vegetation available around the site. Contrarily, charcoal from a single fire is not representative of the whole vegetation, but only of the few randomly-picked logs required for that given combustion event. The low diversity of charcoal spectra from hearths is usually interpreted as their being short-lived, and such samples are avoided by serious anthracologists concerned with documenting past environments.
Nevertheless, beside that consensus for a random collect of firewood, most of us think in terms of "fuel management", admitting that firewood gathering is subject - as other activities - to technical, economic and cultural prescriptions. For historical times and specialized activities, we easily accept that fuel may be chosen according to various properties, including the species. However, we still deny prehistoric societies potential preferences or rejection of wood species used for domestic fires.
Thus, when showing very low diversity, charcoal spectra from deposits are often considered as biased and unusable either for palaeoenvironmental analysis or palaeoeconomical, technical or cultural interpretations.
Through concrete examples, this presentation aims to question our capacity to consider that fuel procurement could be affected by cultural traits, to identify the situations in which we are prone to consider that we are facing wood selection, and to examine the involved criteria (calibre, procurement areas, species etc.).

11 FIREWOOD AND HEARTH FUNCTIONS. TO WHAT EXTENT CAN THEY LIGHT PALEOLITHIC WAYS OF LIFE ?

Author: DR CNRS THERY PARISOT, Isabelle - Université Côte d'Azur; CNRS; CEPAM (Presenting author)
Keywords: hearths, fire, palaeolithic
Presentation Preference: Oral

Due to its bad conservation, there is still limited understanding of how the wood was used by palaeolithic societies. Unlike wood, charcoal is usually well preserved in prehistoric occupations. As witnesses of the activity of human communities exploiting woody taxa from nearby catchments, charcoal is useful for studying the local environment. But even if it is less documented, charcoal remains would also be relevant to address the way past societies managed the fire and surrounded activities. As part of several "systèmes techniques", the management of vegetal resources as fuel provide unreachable information on cultural traits. However, most of the time, we fail in understanding the function of Paleolithic hearths because of the bad conservation of the structures themselves, the scarcity of fuel residue remains, but also due to too actualistic and restrictive knowledge of wood properties. In this paper, we present unpublished results on fuel properties based on experimental studies. In the light of these results, also supported by some archeological examples (e.g. La Combette, Les Canalettes, Chauvet-Pont d'Arc cave, Ormesson, Regismont), we discuss the way hunter-gatherer's societies have managed the firewood, the criteria that could have guided the fuel selection, and the way to objectify the function of hearths in Paleolithic context. We propose that fuel management and hearths functions were mainly constrained by Palaeolithic ways of life which are characterised by significant mobility and seasonal occupation, independently of climate changes.

12 AROUND A PUTATIVE NEANDERTHAL SMOKING HEARTH FROM EL SALT (EASTERN IBERIA): FIREWOOD MANAGEMENT AND CHARCOAL SPATIAL DATA.

Author: Vidal-Matutano, Paloma - Universitat de València; Université Côte-d'Azur, CEPAM, CNRS, France (Presenting author)
Co-Author: Henry, Auréade - Université Côte-d'Azur, CEPAM, CNRS, France; Théry-Parisot, Isabelle - Université Côte-d'Azur, CEPAM, CNRS, France; Mallol, Carolina - Universidad de La Laguna; Hernández, Cristo M. - Universidad de La Laguna; Galván Santos, Bertila - Universidad de La Laguna
Keywords: Neanderthals, Firewood, Fungi
Presentation Preference: Oral

Charcoal analysis 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. So far, the available data on firewood use and management by Neanderthal groups still remain very scarce and only very few studies draw attention to the socio-economic implications linked to fuel use i.e., the existence of

firewood selection criteria as well as the use of alternate fuels. Based on charcoal data from several combustion features from two East Iberian sites, we present the results of a study geared toward the characterization of Neanderthal behaviours around firewood. This research, combining the study of fungal decay features and fragmentation degree with spatial analyses, provides meaningful insights into the nature of the firewood used by Neanderthal groups as well as specific pyrotechnological Middle Palaeolithic activities. Our results point towards dead wood gathering practices, also suggesting smoke-related hearth functions and possible hearth maintenance activities. Dead/decayed wood would have been a valuable resource, easily accessible and capable of meeting all the group's fuel needs especially for the hunter-gatherer way of life which is based on territorial mobility and seasonal occupation of sites. The preferential use of degraded wood by Neanderthal groups suggested by our results could have important implications regarding the firewood catchment area, the wood acquisition strategies and its relation with specific activities (e.g. smoking).

13 WOOD TO BUILD, WOOD TO BURN: WOODLAND EXPLOITATION FOR TIMBER AND DOMESTIC FIREWOOD IN PREHISTORIC BALEARIC ISLANDS (WESTERN MEDITERRANEAN)

Author: Dr. Picornell-Gelabert, Llorenç - Muséum National d\'Histoire Naturelle - Centre National de la Recherche Scientifique - Sorbonne Universités; ArqueoUIB Research Team. University of the Balearic Islands (Presenting author)
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Keywords: humans-trees, dendro-anthracology, woodland
Presentation Preference: Oral

Woodlands provide human societies with a wide range of plant materials which are vital to social life. Among them, wood fulfils different kinds of needs, from energy supply to timber for construction, so its use in a large variety of social activities makes it an essential plant material for different purposes. This repetitive material interaction between people and trees or shrubs in the past left behind an archaeological record that constitutes a primary source of information to study human-environment interactions. We will present an archaeobotanical study of timber and firewood remains in the archaeological record of Bronze and Iron Age Mallorca and Menorca islands (Western Mediterranean). To do so, we will approach wood anatomy from two different perspectives. At first, we will build taxonomical identifications of wood and charcoal materials from 14 different sites in both islands, in which direct evidence of firewood consumption (concentrated and dispersed charcoal fragments) and timber use (burnt and unburned timber) has been identified. Secondly, we will explore the potential of dendro-anthracology on Pinus halepensis charcoal fragments from burnt contexts in two of these sites in order i) to infer the diameters of the pine wood exploited in prehistory and ii) to characterize and compare the two basic modes of pine wood exploitation, firewood and timber. The studied sites are of a varied nature, with domestic, public and funerary spaces and megalithic cyclopean architecture, offering a good context for an approach to firewood and timber consumption and to human-woodland interactions. The holistic consideration of these diverse wood uses will evidently depict human-forest relationships in the most comprehensive so far way.

14 CONTRIBUTIONS OF CHARCOAL ANALYSIS TO THE STUDY OF THE SPECIALIZED FISHING SITE OF BAYOVAR-01 (5TH-8TH CENTURIES AD), NORTHERN COASTAL PERU.

Author: Bermeo, Nicolas - Université Paris 1 Panthéon-Sorbonne; UMR 8096 Archéologie des Amériques (Presenting author)
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Keywords: Anthracology, Northern-Peru,
Presentation Preference: Oral

The Sechura desert located on the extreme northern coast of Peru is one of the most arid places on the planet. Nonetheless, human settlements have been recorded from 5000 BC up to the 15th century AD. A recent paleo-environment study has revealed that an ancient lagoon existed on the southern coast of the desert until the 8th century AD, indicating significant ecological and landscape changes in the area during the pre-Columbian era.
Recent archaeological excavations have been carried out at the site of Bayovar-01 (occupied from the 5th to 8th centuries AD), located on the shore of the ancient lagoon. The new data provide insights into the activities and adaptations of the desert's ancient inhabitants. The presence of two small structures, a large activity area containing a significant amount of fish remains, and traces of large hearths, indicate that Bayovar-01 was an opportunistic settlement, benefitting from favorable environmental conditions along the lagoon, and thus served as a specialized site for fishing and the preparation of fish.
The analysis of charcoal remains from three different features corresponding to large hearth remains sheds light on practices of firewood gathering and usage. Taxonomic and morphological analyses reveal strong preferences for certain taxa, possible gathering strategies combining dead wood collection and tree felling, the usage of several different tree parts, and consistent combustion conditions across the three features. Despite selection biases, taxa composition may offer yet another indication of the existence different environmental conditions in the desert, in connection with the presence of the lagoon.
Anthracological analysis has thus a potential that exceeds mere taxonomic identification of firewood, revealing gathering and usage practices, as well as insights into taxa availability that have implications for ecological and environmental variation.

15 LATEGLACIAL AND EARLY HOLOCENE LANDSCAPE DYNAMICS THROUGH MACROBOTANICAL DATA: EVIDENCE FROM IFRI EL BAROUD (NE MOROCCO)

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Keywords: Maghreb, Plant resources
Presentation Preference: Poster

Ifri El Baroud (34°45´N, 3°18´W), located at 535 m. a. s. l. on the northern slope of the Ich Chaboun massif (Northeast Morocco), constitutes one of the few sites in the whole Maghreb that yield a complete Late Upper Palaeolithic sequence rich in wood charcoal fragments and seeds, including the transition from Late Pleistocene to Holocene. Based on a systematic sampling of macrobotanical evidence through the flotation of sediments, we present the results of a study focused on the characterisation of the local landscape and plant resource management by Later Palaeolithic populations (ca. 23 – 9 ka calBP). With this aim, data obtained come from new archaeological excavations framed in a collaborative project between CRC 806 "Our Way to Europe" (Universities of Cologne, Bonn, Aachen) and INSAP (Institut National des Sciences de l'Archéologie et du Patrimoine, Morocco).

The abundant plant record (charcoal and seeds) from Ifri El Baroud are the result of a human selection depending on their needs. In this sense, apart from dietary purposes, these plant resources played an important role in daily activities, i. e. firewood collection, which may have been a meaningful subsistence task depending on available woody species

in the surroundings of the site. Thus, macrobotanical remains are very useful for landscape reconstruction but also for our understanding of woodland management in the past. At Ifri El Baroud, we have documented the use of few woody species by human groups with special presence of Juniperus / Tetraclinis and Fabaceae which reflects an open xeric landscape.

This research, addressed toward our better understanding of the chronological, cultural and palaeoenvironmental sequence, provided meaningful insight into the nature of human occupations and local landscape dynamics during the Lateglacial and Early Holocene at the Maghreb.

16 INTENTIONAL OR NATURAL DEPOSITS? FINDS OF HERBACEOUS PLANTS AND OTHER COMMON PLANT SPECIES FROM PREHISTORIC ARCHEOLOGICAL SITES FROM ROMANIA

Author: Miss Golea, Mihaela - National History Museum of Romania (Presenting author)
Keywords: archaeobotany, herbaceous plants
Presentation Preference: Poster

Due to plants multiple functional values, the plant world is much more diverse than the animal kingdom. Human beings have being using plants with different intentions from dietary consumption to medicinal or ritual purposes. In archaeobotanical research the emphasis is drawn on domesticated plants, due to their importance and the reasoning behind choosing these different species for domestication. Indeed, in many prehistorical archaeological sites, domesticated macro remains are found in higher number that other plant species. However, the herbaceous plant species that are discovered with domesticated plant remains, such as Polygonum aviculare, Polygonum persicaria or Galium sp. are found in almost all samples but in small numbers. Although the macro remains of such plants are usually natural deposits (animal or windblown deposits), sometimes these discoveries represent intentional human selection.
This kind of intentional selection has been unearthed in Romania, in archaeological sites from Eneolithic to Bronze Age period. Plant species such as Lithospermum officinale, Lithospermum purpuro-caeruleum and Atropa belladonna that can have multiple uses were discovered. Also, other discoveries of species like Polygonum hydropiper, although scarce, might have been used in medicine due to it's active ingredients. These plant species can be used in dietary consumption (Polygonum hydropiper, Polygonum persicaria), medicinal purposes (Polygonum persicaria, Atropa belladonna, Lithospermum purpureo-caeruleum), ritual purposes (Atropa belladonna, Lythospermum officinale) and craft (Lythospermum purpuro-caeruleum).
This work was performed through the Partnerships in Priority Areas Program - PN II, developed with the support of MEN - UEFISCDI, project no. PN-II-PT-PCCA-2013-4-2302.

17 BOXWOOD HISTORY IN NORTHEAST OF IBERIAN PENINSULA

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Keywords: Boxwood, charcoal, pollen
Presentation Preference: Poster

Boxwood (Buxus sempervirens) is one of the precious woods existing in Europe. This wood is very hard and dense, heavy and fine-grained, which make it suitable for carving and also resistant to splitting and chipping. Those extraordinary properties, as well as its appearance, have made boxwood one of the most valued woods for several uses. Historically, it has been used for the manufacture of tools and goods, among them combs, spoons and vessels, as well as for firewood. The evaluation of charcoal and pollen data from different sites and chronology and the evidence of its use for the manufacture of objects demonstrate the importance of boxwood for prehistoric societies.
The low visibility of boxwood in pollen records contrasts with its presence in anthracological contexts in the north-eastern Iberian Peninsula. Buxus would have been present in broadleaf deciduous forests and expanded in phases of deforestation and intensive human impact. Throughout the Holocene, the presence of boxwood charcoal is common, which can be interpreted as indicative of its systematic use as firewood. It has been documented in 49 archaeological levels from Mesolithic to Iron Age, being the second better represented taxon in the analysed samples.
Up to the present time, wooden artefacts have been documented only at La Draga, an early Neolithic site (5324-4977 cal BC) located in the shore of the Lake of Banyoles (Spain). The archaeological layer has been preserved in waterlogged conditions and has provided an exceptional collection of wood instruments, baskets and ropes made of plant fibres that were used for multiple purposes of everyday life. It is remarkable the abundance of Buxus sempervirens among the artefacts, as 83 of the 155 objects were made from this wood. It was used for making sickle handles, digging sticks, wedges, adze handles, needles, combs and other objects of unknown function.

209 ENOUGH LIDAR ON MY PLATE: INTERPRETATION OF CHANGING LANDSCAPES BETWEEN THE AWAKENING AND FALL OF THE ROMAN EMPIRE

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: González Álvarez, David (United Kingdom) - Durham University, UK; Institute of Heritage Studies (Incipit), CSIC, Spain
Co-Author(s): Fonte, João (United Kingdom) - University of Exeter, UK; Institute of Heritage Studies (Incipit), CSIC, SpainCosta García, José M. (Netherlands) - VU University, The Netherlands; University of Santiago de Compostela, Spain
Keywords: remote sensing, landscapes, Roman Archaeology
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

In the last two decades, the use of remote sensing techniques in archaeology has provided a huge amount of new data. However, the constant appearance of new resources and tools has frequently trapped archaeologists in technicalities, making it difficult to build up substantiated and updated socio-cultural narratives. Therefore, the main goal of this session is not to discuss methodological approaches or the quality of the datasets used in Roman Archaeology, but instead to:
- explore the possibilities to overcome the gaps previously exposed and to incorporate the new data provided by remote sensing to the construction of archaeological interpretations through the sharing of experiences based on different case studies.
- evaluate how Roman Archaeology can inform us about the processes of change -in social, cultural and political terms- from a diachronic perspective, and by eminently using spatial datasets.
- assess the best research strategies for dealing with the study of the changes in the landscapes. Considering the geographical diversity of the former territories of the Roman Empire, comparative perspectives should be encouraged. Special consideration will be given to the processes of Roman military conquest and expansion, the episodes of

Romanization and cultural assimilation, and the scenarios of colonial or cultural and identity hybridization.
- analyse how these approaches can help to build bridges between researchers focused on Later Prehistory, the Roman period, and the Early Middle Ages, since the study of these long-term processes has been limited by the compartmentalisation of archaeological research.

01 IS THERE A SAMNITE LANDSCAPE? PUTTING SAMNITE HILLFORTS IN PLACE.

Author: Dr. García Sánchez, Jesús - Leiden University (Presenting author)
Keywords: Hillforts, Landscape, Survey
Presentation Preference: Oral

To start with, Lidar is a rather new research tool in Central-South Italy. The raw data was produced by the Italian Ministero dell'Ambiente e della tutella del Territorio e del Mare to monitor and control hydrogeological risk. Nevertheless, several areas, less risky or threatening for human habitation were no covered. However these areas are frequently located in the upper valley floors, and are possible the most sensitive zones for archaeologists since the forest covers large areas of this landscape and the accessibility is reduce or no existent at all.
We used Lidar data to explore the mountainous and forested regions in order to gain new information about fortified hill tops and hillforts, and their role in the transition from a pre-Roman/ Italic / Samnite landscape to the Roman colonized landscape of Aesernia (modern Isernia).
This paper aims to address the new narratives that the use of new research tools are creating in Central-South Italy. By re-studying known hillforts or by exploring the mountainous landscape using new tools and datasets we aim to gain knowledge about the relevant moment of Romanization and acculturation in Central Italy, an historic territory which was the core of the Samnite society and the scenario of strong Roman influence in the settlement pattern and the effective control of the territory with the presence of new Latin colonies.
I propose a critical inspection of the interpretive capabilities of the new data and how archaeologist are managing, exploiting, and interpreting information produced by old and new techniques, as LiDAR, remote sensing and survey.

02 USE OF LIDAR DATA FOR THE ASSESSMENT OF LOCATIONAL CRITERIA OF EARLY ROMAN FORTIFICATIONS IN THE SERENA REGION (SW SPAIN)

Author: Mr Mayoral Herrera, Victorino - Instituto de Arqueología-Mérida
Co-Author: Ms Parini, Martina Cecilia - Universitá degli Studi di Firenze (Presenting author)
Keywords: LIDAR, Landscape, Archaeology
Presentation Preference: Oral

Since its public release for open access, LIDAR data sets managed by the National Geographic Institute of the Spanish Government have become an extraordinary source of information for landscape archaeology in the Iberian Peninsula. They have expanded enormously our ability to detect archaeological features of a wide range of chronological periods. Nevertheless, beyond this potential as a remote sensing tool, we generally lack an approach oriented to their analytical possibilities. We think that high resolution models derived from these data can be also a valuable source for the understanding of spatial patterns created by human groups in the past. In any case, such a goal has to overcome many technical challenges resulting from the idiosyncrasy of public data: low point densities, classification mistakes and other practical issues. In this paper, we will show our advances in the clarifications of these problems in order to use 3D information for the assessment of defensive capabilities of a network of hilltop-fortified sites in the Serena region (Extremadura, SW of Spain). They are dated in the first stages of the Roman presence in the region (II-I centuries B.C). Information of its defensive architecture is combined with LIDAR derived data about the layout of the natural bedrock of their locations, in order to explore in detail their capabilities for defence, surveillance and territorial control.

03 FROM ARTISTIC RELIEFS TO RELIEF MODELS: ROMAN ARMY PRESENCE AND ITS IMPACT ON THE CENTRAL AREA OF DACIA THROUGH LIDAR

Author: Dr Fonte, João - Institute of Heritage Sciences (Incipit), Spanish National Research Council (CSIC); Department of Archaeology, University of Exeter (Presenting author)
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Keywords: Dacia, Roman-conquest, Dacia,
Presentation Preference: Oral

Under historical circumstances most famously depicted by the epic reliefs of his column in Rome, Trajan completed the conquest of Dacia during two campaigns (101-2; 105-6 AD). Both targeted the upland core of king Decebalus' realm, Sarmizegetusa Regia, now part of the Dacian Citadels in the Orastie Mountains UNESCO WHS. Roman military presence in this area in the form of several temporary bases has been very poorly investigated. Nevertheless, positivist interpretations still widely accepted relates these Roman military bases exclusively to the conquest wars, with the area and its rich mineral resources are thought to be abandoned shortly afterwards.
Recent LiDAR-based research indicates a more widespread and diversified presence of the Roman army there and to new potential relationships with indigenous settlement pattern and mineral resources (Oltean and Hanson in press) which now needs further investigation. Moving forward from that study, this paper will use the new evidence to model connectivity and analyse the diverse natural and social factors which may have impacted on the Roman army operations in this region.

04 SATELLITE REMOTE SENSING AND THE SASANIANS: PERSPECTIVES FROM A NEIGHBOURING EMPIRE

Author: Hopper, Kristen - Durham University (Presenting author)
Co-Author: Lawrence, Dan - Durham University
Keywords: Remote sensing, Sasanian
Presentation Preference: Oral

Stretching from Georgia in the north to Oman in the south, and sharing its western borderlands with the Roman Empire, the Sasanian Empire (224-651 AD) rivalled its neighbour in size and diversity, but has, in comparison, received far less attention from archaeologists until relatively recently. At Durham University, the Persia and its Neighbours project has been investigating the landscapes of the northern and western frontiers of the Sasanian Empire through satellite remote sensing of historical and modern imagery, field survey and excavation. This research has generated large scale long-term settlement datasets for a number of diverse regions. As such, within our project we have faced the issue of not only integrating variable datasets and finding ways to make comparisons at different spatial and temporal scales within a study area, but also between disparate geographical regions. This paper will discuss the approaches we have taken to deal with these issues, the usefulness as well as the limitations of datasets generated through satellite remote sensing, and the importance of viewing these 'imperial' landscapes within the perspective of long-term local settlement histories.

05 THE BLURRED MIRROR: BUILDING UP NEW NARRATIVES TO CALIBRATE THE REAL IMPACT OF THE ROMAN MILITARY PRESENCE IN NW IBERIA

Author: Dr. Costa-García, José Manuel - Universidade de Santiago de Compostela; Vrije Universiteit Amsterdam (Presenting author)
Co-Author: Dr. Fonte, João - Institute of Heritage Sciences (Incipit), Spanish National Research Council (CSIC); University of Exeter; Dr. González Álvarez, David - Institute of Heritage Sciences (Incipit), Spanish National Research Council (CSIC); Durham University
Keywords: Geospatial-techniques, historical-narratives, changing-landscapes
Presentation Preference: Oral

RomanArmy is a research collective focused on the study of the socio-political, economic and cultural changes which took place in NW Iberia in relation to the Roman military presence. To this day, the development of a specific, comprehensive, and multi-scalar methodology for the detection and study of Roman military sites is one of the major successes of this initiative. In this sense, the combined use of different remote sensing techniques has played a vital role.

Our goal now is to go beyond positivist analyses and start to build up new historical narratives based on the new available data. For instance, the use of GIS-based mobility and visibility spatial analyses allow us to better understand the strategic vision behind the actions deployed by the Roman army in these territories.

Old scholarly narratives can be now overcome. In this way, several sites have been detected in areas silent in the Greco-Roman literary sources outside the major conflict areas, and therefore only slightly addressed by the traditional historiography when discussing the process of conquest of NW Iberia between the 2nd c. BC and the 1st c. AD. However, to what extent can the existence of archaeological data related to the Roman military presence be linked with an open conflict?

Several factors could explain the deployment of troops in both war and post-war scenarios, but how can we distinguish the Roman military sites that belong to each moment? The inherent logistic aspects immediately come to mind –e.g. campaign preparations, supplying, road building, or mining-, but the evidence could be also reflecting more subtle expressions of violence in a context of military occupation and territorial reorganisation. Yet, in order to restore the lost pieces of this historical picture we need to adopt inclusive, multi-disciplinary methodologies which should also comprise the study of the native societies.

210 ROCK ART RESEARCH IS ARCHAEOLOGY OR IT IS NOTHING

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Gallinaro, Marina (Italy) - University of Rome La Sapienza
Co-Author(s): Domingo Sanz, Ines (Spain) - ICREA (Institució Catalana de Recerca i Estudis Avançats); Universitat de Barcelona, Secció de Prehistòria i Arqueologia Seminari d'Estudis i Recerques Prehistòriques (SERP)
Keywords: rock art, digital-technologies, physicochemical/isotopic analysis
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Rock art is one of the most fascinating and widespread cultural manifestations of humankind, a special and significant visual archive of past societies. It is present in almost every region around the world, with great variability in terms of chronologies, techniques and geo-cultural contexts. Rock art has always got the attention of scientists, 'amateurs,' administrations and, stakeholders, and more recently of tourist operators. However, for a long time and in many regions rock art research has been marginalized from the mainstream archaeological and anthropological debates. This is mainly due to substantial problems in obtaining absolute dates to place rock art in context. In some international discussion forums, such as EAA meetings, this has led to focus attention on management and preservation or to symbolic and religious aspects, provoking rejection of those advocating for the scientific study of rock art.

The 'Third Science Revolution' of the last decade has also influenced rock art research. The use of state of the art technologies to digitally record rock art, landscape approaches based on quantitative and GIS modelling, as well as the physicochemical and isotopic analysis of pigments are becoming standard tools in approaching rock art. But how new digital technologies contributed to our understanding of rock art? Are new analytical methods contributing to explore new research questions? Have they improved our understanding of past forms of art?
We invite scholars working on rock art research any where in the world to discuss any of these topics from their own perspectives and experiences.

01 IDENTIFYING, CHARACTERISING AND RADIOCARBON DATING CALCIUM OXALATE MINERALS IN MINERAL CRUSTS ASSOCIATED WITH ROCK ART

Author: Jones, Tristen - Archaeology and Natural History, The Australian National University (Presenting author)
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Keywords: radiocarbon dating, geochemistry
Presentation Preference: Oral

The antiquity of the rock art in western Arnhem Land is largely based on a number of relative sequences, constructed by the superimposition of different 'styles' of art. These relative sequences have all contended that the early art of indigenous Australians in western Arnhem Land is of great antiquity, yet currently only one instance of the direct dating of pigment art has culminated in an age of Pleistocene antiquity.
The lack of chronometric ages for north Australian rock art conforms to the wider constraints limiting rock art research globally. The radiocarbon dating capacity of mineral crusts, commonly containing calcium oxalate minerals (whewellite CaC2O4.H2O and weddellite CaC2O4.2H2O), encasing rock surfaces have been investigated by rock art researchers for dating purposes, particularly in Australia for decades.
In this talk we will detail the geochemical makeup of the mineral crusts utilising a variety of techniques including Scanning electron microscopy – energy dispersive spectrometry (SEM-EDS), X-ray diffraction (XRD) and Fourier Transform Infrared (FTIR) Spectroscopy.
We will also describe the revised methodology employed in radiocarbon sample pre-treatment, which is a novel carbon compound-specific separation technique that effectively isolates the carbon compound in the calcium oxalate minerals in sample using chemical pre-treatment. We will then present the radiocarbon age determinations for a western Arnhem Land rock art style – known as the Northern Running Figures.

02 A CRITICAL ASSESSMENT OF THE POTENTIAL AND LIMITATIONS OF PHYSICOCHEMICAL ANALYSIS TO ADVANCE KNOWLEDGE ON LEVANTINE ROCK ART.

Author: Prof. Domingo Sanz, Ines - ICREA; University of Barcelona / SERP (Presenting author)
Co-Author: Dr. Vendrell, Marius - University of Barcelona. Departament de Cristal·lografia, mineralogia i dipòsits minerals
Keywords: Pigments rock art
Presentation Preference: Oral

This paper offers a state of the art review of the variety of physicochemical analysis applied so far to Levantine rock art to characterize de composition of the pigments, as well as the substrate and/or the natural coating covering the paintings. We aim at exploring the guiding principles behind previous analysis, the non-invasive and invasive techniques applied so far to answer the research questions raised, and if the result published as yet have met the expectations of rock art researches. We will also reflect on the potential, the limitations and the future developments of this sort of studies, as well as on the ethics and desirable protocols of applying invasive techniques to this UNESCO World Heritage listed archaeological remain.

03 THE USE OF CAVES WITH PALAEOLITHIC ART IN THE CANTABRIAN REGION AND THE WESTERN PYRENEES: A NEW METHODOLOGY

Author: Dr Ochoa, Blanca - Área de Prehistoria. Dept. de Geografía, Prehistoria y Arqueología. Universidad del País Vasco (UPV/EHU); Archaeology Department. Durham University (Presenting author)
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Keywords: Cave art, Palaeolithic
Presentation Preference: Oral

Cave art has been treated as a special part of the archaeological record. This has resulted in different research approaches linked to aesthetics and art history rather than archaeology. This tendency has changed in the 1990s and the aim now is to reconstruct the past societies through their symbolic expressions.
In this framework we propose a methodology to analyse cave art from an archaeological perspective. Its main goal is to define if there are convergences or divergences in the placement of cave art depictions through the combined study of the parietal art and the specific space where it was executed. The aims are to establish if they selected a specific space due to its geological characteristics, if the location is specific to a certain chronology and if the panels might have been used by a single person or by groups.
With these objectives in mind we selected a series of variables to analyse for instance the presence of archaeological context, the specific location of the figures, the transit through the cave, the morphological characteristics and the capacity of the selected spaces and the visibility of the graphic units.
The analysis allowed us to document the existence of differences in the placement of the depictions. In the Cantabrian region spaces where only individuals or small groups fitted were preferentially selected, though there are also spaces that potentially could have accommodated larger groups, some more than twenty people. We have also observed chronological differences: during the Premagdalenian there is a preference for spaces in the main itinerary of the caves; in the course of the Magdalenian the usage of places outside the main itinerary increases, and the graphic units are smaller. These differences may indicate variability in the functions, uses and meaning of the cave art throughout the Upper Palaeolithic.

04 CONNECTIVITY IN PREHISTORY: THE CONTRIBUTION OF ATLANTIC ROCK ART.

Author: Valdez-Tullett, Joana - University of Southampton; Historic Environment Scotland (Presenting author)
Keywords: Rock-Art, Connectivity, Multi-Scale
Presentation Preference: Oral

A prehistoric carving tradition in Atlantic Europe is known for its cup-and-ring motifs and other images of circular morphology. Found in countries such as Scotland, England, Ireland, Spain and Portugal, it has sparked the curiosity of many. Commonly known as Atlantic Art, this tradition has a long biography of research, mostly conducted by non-professional archaeologists. It has often been ignored by mainstream archaeology, rarely featuring the main European prehistoric narratives. Furthermore, despite the similarities between regions, the majority of studies focus on regional scales and there is little understanding of the connections responsible for the widespread of this iconography.
Richard Bradley (1997), whose work represents an important landmark on the study of Atlantic Art, overcame this tendency with an integrated approach to the subject, exploring the context of the motifs and regional connections, mainly between Britain and Galicia. Although a number of authors have hinted at connections and relationships, this process of cultural transmission is still poorly understood.
Aiming at the assessment of differences and similarities of Atlantic Art, I developed a study based on the analysis of five study areas in five different countries. A 4-scale methodology was devised to investigate the small details of motifs, the rocky medium, the relationship between carved rocks and the wider landscape where they are located. The investigation was carried out with a multi-faceted perspective, which included human and computational valuations, and a combination of methods ranging from GIS to Network Analysis, assisted by digital recording techniques. Results revealed a carving tradition which encompassed much more than morphological resemblances, and demonstrated the importance of rock art in the narrative of prehistoric Atlantic Europe, contributing for a clearer insight into the connectivity and cultural transmission of the region.

05 MATERIAL IMAGERY: VISUAL MODES OF MATERIAL ARTICULATION IN SOUTH SCANDINAVIAN ROCK ART

Author: Ass. Prof. Fahlander, Fredrik - Stockholm University (Presenting author)
Keywords: Rock-art, materiality, 3D
Presentation Preference: Oral

The paper aims at exploring material aspects in the production and use of rock art as a means to study social relations in south Scandinavian Bronze Age. Traditionally, rock art research have mainly focused on representation and symbolism of the imagery and neglected aspects of materiality and agency. The premise of the paper is to stress rock art as material articulations rather than passive representations of Bronze Age culture and cosmology. From such a perspective, rock art is considered a fully integrated materiality with a potential to affect the course of events.
This general point of departure is explored by analyzing aspects of visual modes of material expressions. This includes identifying the varying ways in which new motifs relate to older ones and how imagery of different styles interacts on the panels and in the landscape. With the aid of 3D-scanning and photogrammetry it is possible to analyze displacements in stylistic variability, alterations, re-cuts, superimpositions, and breaking against praxis, the rock art is given a time depth and a social dimension, as well as it emphasizes the potential agency of imagery, that is, how certain motifs may incite actions. From such perspective, rock art is thus not only a description of or a representation of reality, but is actively employed in social relations between different individuals and groups.

06 DIGITAL IMAGING AND THE 'CHAÎNE OPÉRATOIRE' APPROACH TO THE STUDY OF ROCK ART CARVINGS

Author: PhD Diaz-Guardamino, Marta - Cardiff University (Presenting author)
Keywords: Digital-imaging, chaîne-opératoire, rock-art
Presentation Preference: Oral

Rock art carvings have been traditionally studied from a formal point of view. Typological and stylistic approaches focus on the outline of motifs, their combination and location on the panel, look for formal similarities and patterns in arrangement and combination, and interpret them in terms of meaningful frameworks such as chronology, identities or cosmologies. Formal approaches have made important contributions to our understanding of rock art traditions across the globe but they have limitations. They tend to render rock art motifs and panels as static and key aspects such as production and technological skill have rarely been studied. Partly, this has been due to the limitations of the techniques employed to study engraved rock art.

Rock art is the product of the dynamic interaction between people, tools and the rock surface. Furthermore, rock art panels may accrue complex biographies via multiple engagements. This paper considers the combination of a 'chaîne opératoire' approach with digital imaging technologies (e.g. RTI, close range photogrammetry) to the study of rock art carvings as a way forward to address these questions. I present the results of recent research on Iberian Late Bronze Age stelae, which are decorated with fairly standardized iconographies that are broadly distributed. By focusing on the 'biographies' of these decorated stones (how they were made, reworked, and so on), relevant details emerge. Firstly, despite iconographic standardisation, there is variability in the techniques and procedures deployed, and this can be linked to the interplay between the stone, the skill of the carver and her/his knowledge of local rock art traditions. Secondly, stelae can be reworked at different stages and reused in a variety of ways, opening up a necessary debate about the temporality of rock art traditions.

07 ARCHAEOACOUSTICS AND THE 'THIRD SCIENCE REVOLUTION' IN ROCK ART STUDIES

Author: Professor Diaz-Andreu, Margarita - ICREA; Universitat de Barcelona (Presenting author)
Co-Author: Dr Mattioli, Tommaso - Universitat de Barcelona
Keywords: Third-Science-Revolution, archaeoacoustics, rock-art-interpretation
Presentation Preference: Oral

Interdisciplinarity is a key component in rock art studies and it is certainly an essential component of the third science revolution. It has been pointed out that archaeology is going through in a period of "theoretical and methodological experimentation and reorientations". One of them is the opening of archaeology towards the intangible aspects of culture, such as sound. The field of rock art has increasingly been aware of this but until recently it had the problem of lacking good techniques to measure acoustics in the type of spatial contexts where rock art is found. The recent adaptation of methods developed within physics, architecture and musicology to archaeology has, however, opened up new avenues for research. In this paper we will propose that the new archaeoacoustic analytical methods are contributing in innovative ways to explore new research questions. In our research on the acoustics of rock art landscapes in the Western Mediterranean we have endeavoured to explore to what extent experiencing sounds in the landscape may have influenced rock art creators and guided them in the selection of places in which to produce rock art. We have also assessed to what extent the choice of the place to decorate may have been determined by the aural experiences people felt in the rock art sites themselves. We will argue that our results are bringing a fresh look at the multiple ways in which past forms of art can be understood, not only in the Western Mediterranean but beyond it.

08 LANDSCAPE-ARCHAEOLOGY OF A ROCK ART REGION – THE BRANDBERG IN NAMIBIA.

Author: Dr Lenssen-Erz, Tilman - University of Cologne
Co-Author: Vogels, Oliver - University of Cologne (Presenting author)
Keywords: rock-art, GIS, remote-sensing
Presentation Preference: Oral

Archaeological sites are the carbon copy of human exploitation strategies. In this respect, sites are to be seen as parts of a system, like organs within an organism. However, a complete network of sites is often hard to recover, e.g. due to hardly visible short term occupation or high sedimentation rates. Rock art however can be visible for hundreds or thousands of years due to its durabilty and placing over ground. Once an entire rock art region has been recorded, it allows for an analysis of a complete human exploitation regime. Besides this, rock art illuminates the discourse of past cultures and yields information about the emic meaning and function of a location.

The rock art sites within the mountainous massif of the Brandberg (Daureb) in northern-central Namibia have been documented almost in full by Cologne University's projects. GIS analyses along with remote sensing now give way to new insights into the underlying spatial networks. On a broader regional scale, the Brandberg, lying at the fringe of the Namib Desert and the semiarid highland savanna, is known to be a very particular point of interest in terms of climate, flora and fauna. A time series of seasonal vegetation mappings from satellite imagery is here used for a more elaborate understanding of the seasonal mobility in the region and within the Brandberg massif (as inscribed into the landscape by rock art sites). On a smaller regional scale, spatial attributes of the Brandberg rock art sites reflect discernible site functions, raising the question in which ways the paintings in their contents may reflect these human occupation patterns.

09 PROYECTO ARQUEOLÓGICO TORO MUERTO - NEW TECHNOLOGIES IN DOCUMENTATION OF ROCK ART SITES

Author: Ms Juszczyk, Karolina - University of Warsaw (Presenting author)
Keywords: petroglyphs, GIS, Peru
Presentation Preference: Oral

My paper will concern the documentation work carried out on the archaeological site of Toro Muerto (dept. of Arequipa, Peru) during two seasons of research carried out in 2015-2016. This site is one of the largest repositories of rock art in the world and it is estimated that there are approximately 5-6 thousand boulders covered with the petroglyphs. The aim of the work was to draw a thorough inventory of the majority of the site. Due to the large number of monuments and the size of the area in which they can be found (approximately 50 km^2), several measurement and documentation methods employed in archaeology and topography were used.
The main measurement method consisted of surveying, in which we used total station equipment and hand-held GPS. All measurements were also checked against a satellite map which also served as the basis for making current orthophotography created from aerial photos. Every stone was also documented with photographs and descriptions. The

most interesting of the petroglyphs were recorded using traditional methods consisting of redrawing and by 2D photogrammetry. All documentation which was done in the field was then transformed into digitilized form and put into iconography database of Toro Muerto site created by us.
For comparative purposes we also made dozens of accurate records of petroglyphs taking advantage of the silicone pattern and 3D photogrammetry for a few selected iconographic motifs. The 3D models allows us to do some technological analysis of the rites. We also elaborated a digital terrain model (DTM) based on satellite imagery.
The result of the project was to prepare a website with a database that is available online to all researchers interested in the rock art. All these data is also presented in GIS form which allows us to do the geospatial analysis.

10 ANALYZING ROCK ART BEYOND INTERCULTURAL HERMENEUTICS

Author: Prof. Dr. Mathiak, Brigitte - Universität zu KölnDr. Lenssen-Erz, Tilman - Universität zu Köln
Co-Author: M.A. Fäder, Eymard - University of Cologne - Institute for Prehistoric Archaeology (Presenting author)
Keywords: rock art data-mining computational linguistics
Presentation Preference: Oral

In combining information theory and statistics with art history and archeology, the rock paintings of the Brandberg/Daureb (Namibia) are uniquely suited for deciphering meaning in rock art without having to rely on a presupposed cultural context first. The basis for our case study will be the rich Brandberg/Daureb database on rock art.These rock art data have been recorded with a textual methodology and include all rock paintings in an area of c. 300 km2 on this Inselberg. In this region there are over 840 sites with more than 39000 single figures and 4863 scenes (featuring 17507 participants). Every single one of these pictures has been published in standardized scale together with the data of the individual figure, the scenes and the sites (Pager 1989 – 2006). This database is unique worldwide in terms of quantity as well as in terms of approach, as it was assembled for data processing purposes and therefore needs comparatively little pre-processing. In particular, the systematic analysis of scenes is still without parallel as it uses the linguistic concept of a paragraph in discourse analyses (with its information bits topic/focus/setting) as methodological orientation. Single figures are conceptualized in terms of the linguistic notion of a proposition (subject, predication and object relation). The data, thus being principally ordered according to linguistic concepts, invites further computer based processing. The research questions about single figures and their relation to aggregations of figures also address some of the most relevant questions in rock art research, where large panels with many figures and layered palimpsests always posed a problem that hardly anyone challenged in a non-idiosyncratic approach.

11 THE "DSTRETCH" FOR ENGRAVINGS

Author: Jalandoni, Andrea - Place, Evolution and Rock Art Heritage Unit (PERAHU) & Environmental Futures Research Institute (EFRI), Gold Coast campus, Griffith University, Queensland 4222, Australia. (Presenting author)
Co-Author: Kottermair, Maria - Center for Island Sustainability (CIS), University of Guam, Mangilao, Guam, USA
Keywords: engravings, digital-enhancement, GIS
Presentation Preference: Oral

Rock art researchers are in need of the equivalent of DStretch for rock art engraving. The method we would like to introduce is both low-cost and effective at highlighting obscure engravings by using Structure from Motion (SfM) photogrammetry and Geographic Information System (GIS) tools. Being able to see the rock art is the first step to an accurate recording. While we can argue that the latest technology still does not lead to a perfectly objective record, attempts to understand the rock art in context and any interpretations offered should be based on the most reliable data available. Furthermore, the use of GIS software allows for a spatially-linked database that facilitates statistical descriptions and analysis.

12 SPATIAL ANALYSIS AND CHRONOLOGY IN THE STUDY OF THE CLIFF PAINTINGS OF FINLAND: METHODS AND CHALLENGES

Author: Niskanen, Karen - University of Oulu (Presenting author)
Keywords: pictograph, chronology, GIS
Presentation Preference: Oral

The cliff paintings in Finland are dated with relative chronological methods: stylistic comparative analysis, dating by association with neighbouring dwelling sites and stray finds, and shoreline displacement chronology. As a result of this lack of absolute chronology, ethnographic studies of the cliff paintings have dominated the archaeological dialogue, while examination of the art in relation to the archaeological contexts and ancient environments has been considered tenuous. This paper discusses the challenges of this time perspective in the application and interpretation of GIS spatial analysis techniques in archaeological studies of the cliff paintings in Finland.

13 DIGITAL ROCKS NEW TECHNOLOGIES FOR AN INTEGRATED APPROACH TO ROCK ART.

Author: Dr Rondini, Paolo - University of Pavia (Presenting author)
Keywords: Rock-Art, 3D, Methodology
Presentation Preference: Oral

The study of rock art is an exceptional tool for a better understanding of past societies, as well as one of the most widespread and varied disciplines of archeology. Working and studying in the UNESCO site n.94 "Rock Drawings in Valcamonica" means having to deal with the study of rock engravings, a discipline that has been shaped, in its methodological aspects, by many historic figures and a number of scholars, not always without academic conflicts.
The level of subjectivity of the tracings and their adherence to the real engraved figures are among the most important and thorny issues, when facing the study of the iconographic, symbolic and chronological aspects of rock art. Nevertheless, the tracing methodology most widely used is still, with the exception of several cursory openings to the digital age, the same which was elaborated in 1970s.
The poster here presented illustrates the main guidelines of a new kind of approach to the tracing and the subsequent study of rock art: one which, mixing up the traditional analogic methods with the latest digital technologies, addresses the issue from an integrated perspective. In particular, our line of work enhances the phisical interactions to the object with hi-definition 3D modeling and mesh manipulations, in order to produce a vectorial, layered tracing of the engravings.
As a case of study will be presented an excerpt from an ongoing, unpublished, research: the study of the engraved boulders from the Copper Age Sanctuary of Ossimo, Pat (BS), in Northern Italy.

213 VIKINGS ON THE EDGE: THE LIMITS OF VIKING EXPANSION AND INFLUENCE IN THE LOW COUNTRIES AND BEYOND

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Deckers, Pieterjan (Belgium) - Vrije Universiteit Brussel
Co-Author(s): IJssennagger, Nelleke (Netherlands) - Fries Museum, Leeuwarden; University of GroningenLeonard, Alison (United Kingdom) - University of York; University of Cambridge
Keywords: Vikings, Low Countries, historiography, identity
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

MERC
Medieval Europe Research Community

The current popularity of the Vikings is not a new phenomenon. They are a traditional focus of research, and archaeologists have even attempted to trace their presence and impact in regions where it can only be inferred from scarce 'Scandinavian-style' artefacts or dispersed historical attestations and place-names. The Low Countries are one such area where Viking presence, known from written sources, has long been sought, but never convincingly captured in a coherent, critical and archaeologically informed narrative. In this paper we aim to discuss theoretical, interpretive and methodological issues related to Scandinavian influence in the periphery of the known Viking expansion – or in the periphery of contemporary Viking Studies – with a particular focus on the Low Countries and the immediately adjoining areas. However, we explicitly welcome contributions that critically examine or compare aspects of Viking Studies in other areas 'on the edge', e.g. in southern and eastern Europe.
Contributors are requested to consider one or several of the following topics:
-the historiography and continued topicality of the Viking phenomenon in the Low Countries and other peripheral areas;
-the validity and applicability of such oft-invoked concepts as identity, culture contact, hybridity and diaspora;
-old and new interpretive approaches useful to discerning Viking elements in the archaeological record;
-the usefulness of the label 'Viking', in light of both the broad social and cultural networks pre-dating the Viking Age, and the finer grain of identity politics that resulted in the dispersal of Scandinavian cultural elements across large parts of Europe.

01 CONNECTIVITY IN THE 'LONG' VIKING AGE: STUDIES FROM THE EDGES OF THE NORTH SEA

Author: Dr Leonard, Alison - University of York; University of Cambridge (Presenting author)
Co-Author: Dr Ashby, Steve - University of York; Prof Tys, Dries - Vrije Universiteit Brussel
Keywords: Viking, metal-detecting, imports
Presentation Preference: Oral

New heritage initiatives in northwestern Europe such as the Portable Antiquities of the Netherlands (PAN), MEDEA (Flanders), and DIME (Denmark), now join England's Portable Antiquities Scheme (PAS) to provide open access, searchable databases that record publicly-found archaeology, particularly metal-detected artefacts. These schemes benefit researchers and public enthusiasts alike, and will play a crucial role in yielding new evidence and interpretations of Viking-Age activity for years to come. A recent collaborative pilot study based at the University of York tested the compatibility of the data arising from these different regions, focusing on a selection of early medieval artefact types. It was found that, by addressing several key incongruities, metal-detected data from Danish, Dutch, English, and Flemish sources could be assessed alongside each other. Having established their compatibility and the exciting opportunities for future research that these initiatives afford as a collective, this paper will focus on the results of analysis of the select artefact types. It will look in particular at the evidence for communication and connectivity across the North Sea that imported or foreign-influenced artefacts provide. It is argued that from the perspective of international connectivity, the 'Viking Age' is best viewed within a longer chronology, from the mid-seventh century. This provides a broader context against which 'Viking' influence and expansion can be evaluated, and raises questions about accepted characterisations associated with 'Viking' and 'Viking Age' labels. The paper will focus on case studies drawn from the North Sea littoral, in the Low Countries and beyond.

02 THE INVISIBLE BOUNDARIES OF THE VIKING WORLD? THE CASE OF FRISIA.

Author: Drs. IJssennagger, Nelleke - Fries Museum; University of Groningen (Presenting author)
Keywords: Viking, Frisia, Metal-detecting
Presentation Preference: Oral

The Viking world - we are used to seeing maps of this world, marked with areas of impact and importance and clear, visible boundaries. They immediately raise the question to what extent the areas that fall just outside the boundaries and marked regions were affected by the sphere of the Vikings or "Viking phenomenon". Moreover, it makes us question where we draw the boundaries; around which edge, and on what grounds? Was the impact in the unmarked regions just too small, or too hard to pinpoint archaeologically, to simply convincingly plcae them within the boundary? Could these areas represent more invisible boundaries of the Viking world? And if so, then what are the boxes that we have to tick to convincingly place them within the Viking sphere and to make the invisible boundaries visible?

In this paper, I would like to discuss what happens if we start looking at these 'edges' in a more regional instead of a national perspective, and subsequently review this regional image in a larger Viking world perspective. It will be argued that by studying not the sum of a "Viking impact" on a given area, but rather the connectivity of the area with the Viking sphere, we can shed light on the invisible boundaries of the Viking world. This can even be done in those areas where long-standing relations bound the areas together and created shared cultural baggage. Based on my recent PhD-results, I will present the case of historic Dutch Frisia and its relation to the Viking sphere that dominated the North Sea, to show how material culture in combination with new approaches to a wide range of textual evidence that shed light on the connectivity, can make the invisible boundaries visible.

03 BEYOND BURNING AND PILLAGING: SCANDINAVIAN PRESENCE AND CULTURAL INFLUENCE IN THE SOUTHERN LOW COUNTRIES, 8TH-11TH CENTURIES

Author: Dr Deckers, Pieterjan - Vrije Universiteit Brussel (Presenting author)
Co-Author: Prof Dr Tys, Dries - Vrije Universiteit Brussel; Dr Wouters, Barbora - Vrije Universiteit Brussel
Keywords: vikings, identity, material_culture
Presentation Preference: Oral

The stereotypical image associated with early medieval Scandinavian activity in the southern Low Countries is that of aggression and devastation originally painted by contemporary chroniclers but reiterated in research and public perception until today. These historically attested raids started in the early 9th century, and saw their peak between AD 878 and 892, when the Great Army, having left England, terrorized the region between Seine and Rhine.
New archaeological finds as well as reconsideration of older finds and historical sources necessitate a more nuanced narrative. Contact between Scandinavia, notably Denmark, and the Low Countries should be placed within a much longer-term perspective - starting (at least) in the early 8th century. Furthermore, this interaction was by no means restricted to hostile encounters. Rather, it is more and more clear that at least parts of the area under consideration were integrated into the Scandinavian-dominated network of social, economic and cultural interaction spanning the southern North Sea. As late as the 11th and 12th centuries, close social and political contacts existed between coastal Flanders and Denmark. Material culture, such as horse-riding gear, also indicates that the inhabitants of the County of Flanders looked primarily overseas in the construction of their identity within post-Carolingian Europe, thus perpetuating long-standing cultural ties.

04 ON BOARD WITH THE CREW: IDENTITY FORMATION AND SOCIO-POLITICAL COHESION AMONG VIKING WARBANDS AND ARMIES

Author: Dr. Raffield, Ben - Uppsala University (Presenting author)
Keywords: Vikings, armies, identity
Presentation Preference: Oral

In recent years, it has become clear that the term 'Viking' is problematic when used as a moniker to discuss the primarily Scandinavian raiding parties and fleets that were operating across northwestern Europe during the 8th-11th centuries. It implies that these groups possessed homogenous and clearly defined social and political identities, and that they shared a notion of cultural solidarity. However, scholars are increasingly demonstrating that these groups were in fact not only disparate and highly individualistic, but that they were also ethnically and socially heterogeneous.

This paper will explore the evidence for the formation and maintenance of group identity among Viking raiding parties and warbands, as well as the longer-term impacts of these processes on the operation of the large, migratory fleets that were active in northwestern Europe during the mid- to late-9th century. I argue that not only were tight-knit communal identities central to the operational success of individual groups, but that these identities were also subject to continuous evolution as a result of experiences shared while operating abroad. I will then explore the impacts that this might have had on inter-group cooperation at times when individual groups sailed and fought in consort with others.

214 THE OTHER SIDE: THE REALITY OF THE EARLIEST FARMING IN EUROPE AND LESSONS FOR UNDERSTANDING AGRICULTURAL ORIGINS

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Gron, Kurt (United Kingdom) - Durham University
Co-Author(s): Rowley-Conwy, Peter (United Kingdom) - Durham UniversitySørensen, Lasse (Denmark) - The National Museum of Denmark
Keywords: Neolithic, Agricultural Origins, Europe, Farming
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

All farming in prehistoric Europe ultimately came from elsewhere in one way or another, unlike the growing numbers of primary centers of domestication and agricultural origins worldwide, This fact affects every aspect of our understanding of the start of farming on the continent because it means that ultimately, domesticated plants and animals came from somewhere else, and from someone else. In an area as vast as Europe, the process by which food production becomes the predominant subsistence strategy is of course highly variable, but in a sense the outcome is the same, and has the potential for addressing more large-scale questions regarding agricultural origins. Therefore, a detailed understanding of all aspects of farming in its absolute earliest form in various regions of Europe can potentially provide new perspective on the mechanisms by which this monumental change comes to human societies and regions. In this session, we aim to collect various perspectives from the archaeological sciences regarding the earliest farming from across Europe. Methodological approach, archaeological culture, and geographic location in Europe are open, but papers must engage with the simple question: What was the earliest farming like? By doing so, we hope to open a conversation about agriculture just after the transition in order to address the role incoming people, technologies, and adaptations have in secondary adoptions.

01 THE OTHER SIDE: INTRODUCTION TO SESSION 214

Author: Dr. Gron, Kurt - Durham University (Presenting author)
Co-Author: Professor Rowley-Conwy, Peter - Durham University; Dr. Sørensen, Lasse - The National Museum of Denmark
Keywords: Neolithic, Agriculture, Introduction
Presentation Preference: Oral

In this session introduction, we present the rationale and background for Session #214, The other side: The reality of the earliest farming in Europe and lessons for understanding agricultural origins.

02 PIONEER FARMING IN THE BALKANS DURING THE EARLY SIXTH MILLENNIUM BC: INTEGRATING QUANTITATIVE BIOARCHAEOLOGICAL DATASETS WITH BIOCLIMATIC PARAMETERS

Author: Dr Ivanova, Maria - University of Heidelberg (Presenting author)
Co-Author: Dr Marinova, Elena - KU Leuven; Dr De Cupere, Bea - Royal Belgian Institute of Natural Sciences
Keywords: Balkans, climate, farming
Presentation Preference: Oral

The Balkans acted as a unique „laboratory" for the adaptation of southwest-Asian farming to the environmental conditions of interior Europe. Initially developed in the zone of warm temperate climate with hot summers and steppic to semi-arid precipitation regime, in the first millennia of its existence this farming system based on endemic Near Eastern species dispersed within the limits of its native climatic zone. The earliest successful introduction of domesticates beyond the natural habitats of their wild progenitors took place in the interior of the Balkans during the early sixth millennium BC. Here, within a few centuries, cultivation and herding spread northwards across a variety of climatic zones, ranging from sub-Mediterranean to continental. How did these pioneers and their close descendants manage to make a living on the „other side" of the climatic border? We integrate quantitative datasets of plant and animal remains form the earliest farming sites with bioclimatic predictors by multivariate statistical analysis to identify variation in subsistence and its relation to climate. The results indicate that distinct zones of farming and wild-resource procurement developed within the Balkans, with sites from similar biogeographic zones clustering close together, irrespective of their cultural affiliation.

03 FIRST FARMERS OF THE ADRIATIC: EXAMINING THE TIMING, TEMPO, AND CHARACTER OF DOMESTIC ANIMAL MANAGEMENT IN THE ADRIATIC

Author: Dr. McClure, Sarah - The Pennsylvania State University (Presenting author)
Co-Author: Podrug, Emil - Sibenik City Museum, Sibenik, Croatia
Keywords: Neolithic, Livestock, Adriatic
Presentation Preference: Oral

The spread of farming into the Adriatic ca. 8000 years ago ushered in a new chapter in cultural and environmental history. The translocation of plants and animals, new organization of human settlements and activities shaped landscapes for future generations. The origins of these legacy effects lay in the actions and adaptations of these earliest Impresso period farmers. In this paper we summarize current evidence for the timing and tempo of the spread of farming in the Adriatic, and look more specifically at the available data for domestic animal management practices throughout the region. These introduced species were one of the mechanisms for establishing agricultural niches in new environmental zones and provided the earliest farmers with reliable sources of food. New faunal data from Neolithic Dalmatia aims to document the scale of domestic animal use among Impresso farmers as a first step in characterizing management strategies and their local ecological impacts. By comparing datasets regionally, we can then begin to address commonalities and nuanced differences in the effects pastoral activities had on local and regional environments, and consider how these may have had different legacies for ecological and cultural developments during the Neolithic.

04 WHO WERE THE EARLIEST FARMERS? INTERACTIONS - INNOVATIONS - ADAPTATIONS AT EARLIEST NEOLITHIC OF THE CENTRAL BALKANS, HUMAN BIOARCHAEOLOGICAL PERSPECTIVES

Author: de Becdelievre, Camille - Faculty of Philosophy, University of Belgrade (Presenting author)
Co-Author: Jovanović, Jelena - BioSense Institute, University of Novi Sad; Dr Hofmanová, Zuzana - Department of Biology, University of Fribourg, Switzerland; Dr Stefanović, Sofija - BioSense Institute, University of Novi Sad, Serbia; Laboratory for Bioarchaeology, Department of Archaeology, Faculty of Philosophy, University of Belgrade, Serbia
Keywords: Bioarchaeology-Anthropology, Balkans, Neolithic
Presentation Preference: Oral

A major transition occurred during the first part of the Holocene: Humans entered a new adaptive niche by settling in favored environment and by domesticating species of plants and animals. From primary "centers of domestication", it is frequently considered that Neolithic farmers - as well as the idea of agriculture - spread to some "marginal" areas. Simultaneously, a main event of demographic expansion occurred, and it seems that this process impacted at various degrees both the human health and the human biology. Focusing on the analysis of the remains of more than 500 humans discovered in several regions of the Balkans (the Danube Gorges; the territory of the Central Balkans; the Great Pannonian Plain), and covering the Mesolithic (9500 BC - 6200 BC) and the Early Neolithic (6200 - 5500 BC), we discuss this usual perception of Neolithization as "an episode of ecological niche colonization" by addressing simple questions: who were the earliest famers in the Central Balkans? what were they looking like? and what about their living conditions?

To better understand the behavioral mechanisms and the biological outcomes of the Neolithization process, we tackle the issues of migrations, diet, health and bodily adaptations by synthesizing data coming from recent analyses: physical anthropology, 3D morphometric, stable isotopes, aDNA. Taken as a whole, results suggest that Neolithization should be understood as a complex phenomenon combining both foragers innovations and farmers migrations, foragers and farmers interactions in some specific spots, local behavioral adaptations - particularly in term of subsistence patterns - to environmental conditions, a global health decline and a specific pattern of body adaptation to the new sedentary lifestyle. By offering a glimpse into the life of the first farming communities this study also emphasizes the contributions of Human Behavioral Ecology to our understanding of the mechanisms of bio-cultural adaptations.

05 CAN SPATIO-TEMPORAL KERNELS PROVIDE A BETTER UNDERSTANDING OF THE EARLIEST FARMING EXPANSION THROUGH THE MEDITERRANEAN?

Author: Dr Diez Castillo, Agustín - Universitat de València (Presenting author)
Co-Author: Dr García Puchol, Oreto - Universitat de València; Prof McLure, Sarah - Pennsylvania State University; Prof Bernabeu Aubán, Joan - Universitat de València; Dr Pardo-Gordó, Salvador - Universitat de València
Keywords: Neolithic Mediterranean Radiocarbon
Presentation Preference: Oral

A few centuries before the 8000 BP, beginning in the island of Corfú and the Adriatic coasts, a particular 'Neolithic package' characterised by Impressed ware ceramics began a journey that in a few centuries seem to end in the central coast of Portugal. Some milestones of it (namely the arrival to Croatia, the south of Italy, Sicily, Genoa and Valencia gulfs) seems clear but other like the arrival to north-eastern Italy, Tunisia, Algeria, Morocco and the gulf of Cadiz not so. The arrival of the agricultural way of life to one of the other sides

of Europe (Iberia) is a crucial theme for understanding peoples and ideas movement. In this presentation, we try to take a look to the geographical insights of the process through a careful cartography of it. Spatial analysis together with the use of radiocarbon data as a demographic proxy are becoming one of the keystones to understand what, from where, and why the constituents of the 'package' move through Europe. To date, one of the main misunderstandings of the neolithisation process is still the lack of agreement in what it is or is not. To avoid, in some extent, the problem we take a multifocal approach to the process, so we deeply analyse (filtering) Early Neolithic sites having any of the indubitable features of the "package", later we analyse only cereal directly dated remains, same with only domestic animals (even if here some disagreement among specialist arise), and, eventually, we merge plant and animal datasets to see if there are or not some changes. Those different approaches provide a set of scenarios that allow us to present different pathways for the arrival of agricultural way of life to the Iberian Peninsula through a series of maps building a complete Neolithic cartography tries to remark those pathways.

06 ORIGINS AND EVOLUTION OF PIG DOMESTICATION IN ITALY: A BIOMETRICAL STUDY

Author: Lic. Tecce, Sofia - The University of Sheffield (Presenting author)
Co-Author: Dr. Albarella, Umberto - The University of Sheffield
Keywords: Domestication, Italy, Neolithic
Presentation Preference: Oral

The aim of this paper is to analyse how pigs can contribute to the understanding of the life of early Neolithic communities in Italy. In the past, a series of issues have hindered studies on the emergence of pig husbandry as a new cultural and economic phenomenon in the Italian peninsula, namely the intrinsic difficulties in understanding such process in the archaeological record, the scarcity of well-dated evidence, and the local focus of most studies carried out so far. In this paper the origins of domestic pigs in the peninsula are analysed through the comparison of data from several early Neolithic Italian sites. The following research questions will be tackled: does the current hypothesis of a mixed origin (local and introduced) of pig domestication in Italy hold to the scrutiny of the analysis of a larger sample, both in terms of actual data and geographic/chronological coverage? As a whole, does the pattern of pig domestication in Italy appear to be unique or is it similar to other European areas? How can it be integrated with our overall understanding of the beginning of farming in Europe? The main methodology used is the collection of comparable biometrical data from several prehistoric sites in Italy in order to detect patterns of regional and chronological change.

07 FIRST FARMERS IN LIGURIA, NORTHWESTERN ITALY: NEW EVIDENCE FROM ARENE CANDIDE

Author: Professor Rowley-Conwy, Peter - Durham University (Presenting author)
Co-Author: Ms Panelli, Chiara - University of Nice; Dr Rossi, Stefano - Soprintendenza dei Beni Culturali, Genova; Dr Maggi, Roberto - retired
Keywords: sheep Impressa Italy
Presentation Preference: Oral

Recent excavations in the famous cave of Arene Candide have identified numerous micro-stratigraphic layers. The Early Neolithic (Cardial and Impressa, c. 5800 – 5400 cal BC) alone have been subdivided into 11 stratigraphic units producing over 2500 large mammal NISP. The assemblages are (a) exceptionally well preserved – no dog gnawing was observed in the Early Neolithic – and (b) exceptionally well recovered – all deposits were sieved. Great effort was made to distinguish between sheep and goat. These factors permit the Early Neolithic economy to be examined in greater detail than has hitherto been possible. Sheep appears to have been the only domestic animal present during the earliest (Impressa) phase. A few cattle and a very few possible goats appear in the later Early Neolithic Cardial phase. Pigs may have been wild throughout. The sheep bones indicate that a dairy economy was practiced from the start of the occupation.

08 EARLIEST FARMING IN NORTH-WESTERN MEDITERRANEAN: EVIDENCES FROM CASTELLAR – PENDIMOUN DURING THE 6TH MILLENNIUM BCE

Author: Dr Binder, Didier - Université Côte d'Azur; CNRS; Cultures et Environnements. Préhistoire, Antiquité, Moyen-Âge (Presenting author)
Co-Author: Ms Battentier, Janet - Université Côte d'Azur; CNRS; Cultures et Environnements. Préhistoire, Antiquité, Moyen-Âge; Dr Bouby, Laurent - Université Montpellier; CNRS; Institut des Sciences de l'Evolution; Dr Brochier, Jacques-Elie - Aix-Marseille Université; CNRS; Laboratoire Méditerranéen de Préhistoire, Europe, Afrique; Mr Carré, Alain - Université Côte d'Azur; CNRS; Cultures et Environnements. Préhistoire, Antiquité, Moyen-Âge; Dr Cucchi, Thomas - Muséum National d'Histoire Naturelle; CNRS; Archéozoologie, Archéobotanique; Dr Delhon, Claire - Université Côte d'Azur; CNRS; Cultures et Environnements. Préhistoire, Antiquité, Moyen-Âge; Ms De Stefanis, Cristina - Université Côte d'Azur; CNRS; Cultures et Environnements. Préhistoire, Antiquité, Moyen-Âge; Ms Drieu, Léa - Université Côte d'Azur; CNRS; Cultures et Environnements. Préhistoire, Antiquité, Moyen-Âge; Dr Evin, Allowen - Institut des Sciences de l'Evolution; CNRS; Institut des Sciences de l'Evolution; Dr Girdland Flink, Linus - Liverpool John Moores University; Dr Goude, Gwenaëlle - Aix-Marseille Université; CNRS; Ministère de la Culture et de la Communication; Laboratoire Méditerranéen de Préhistoire, Europe, Afrique; Dr Gourichon, Lionel - Université Côte d'Azur; CNRS; Cultures et Environnements. Préhistoire, Antiquité, Moyen-Âge; Dr Guillon, Sébastien - Université Côte d'Azur; CNRS; Cultures et Environnements. Préhistoire, Antiquité, Moyen-Âge; Dr Hamon, Caroline - Université Paris Panthéon Sorbonne; CNRS; Trajectoires. De la sédentarisation à l'Etat; Dr Helmer, Daniel - Université Lyon 2; CNRS; Archéorient; Dr Thiébault, Stéphanie - Muséum National d'Histoire Naturelle; CNRS; Archéozoologie, Archéobotanique
Keywords: Impresso-cardial, farming, transdisciplinarity
Presentation Preference: Oral

In South-Eastern France, Pendimoun rockshelter has provided a detailed stratigraphy recording one of the earliest farmers' settlement in the North-Western Mediterranean and its evolution during the 6th millennium. Accordingly, regional off-site pollen analysis evidence traces of cropping at the beginning of the 6th millennium on alluvial plains close to the littoral.
A transdisciplinary close partnership was implemented for depicting a holistic view of this early farming system.
Archaeozoological studies and sedimentology demonstrate the sheep and cattle breeding at the very beginning of the occupation (Impressa phase, 58th – 56th century BCE). In the same context, extensive carpological and phytolith sampling and analyses evidence the cropping of emmer and barley, the introduction of rough cereals, while stone tool technology and micro-wear studies demonstrate their processing in the shelter. Biomolecular archaeology questions the pots' use.
During the following phases (Cardial and transition to the Square Mouthed Pottery culture), the evidences of farming activities decrease at the benefit of hunting and wild plant gathering. Through this evolution, livestock composition changes, with the apparition of goat within the Cardial and domesticated pig within the Initial SMP. The latter is demonstrated thanks to geometric morphology and ancient DNA. Data available for the Early Cardial phase (mid-6th millennium) allow to discuss the correlation between zoological and botanical spectra and the isotopic spectra. The authors interpret this evolution as a sign of a more peripheral position of the site as regards the farming centres and its connection to more extended pastoral networks. This should explain the low impact of human activities on the local environment till the end of the 5th millennium.

09 INTEGRATING DOMESTICATES: EARLIEST FARMING EXPERIENCES IN THE IBERIAN PENINSULA

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Keywords: Neolithic,husbandry, domestication
Presentation Preference: Oral

The first farming experiences at the westernmost of the Mediterranean present, in early Neolithic, a wide diversity in relation to the species involved and the intensity of their exploitation, evidencing different regional dynamics. A synthesis of the available Iberian Peninsula's data is presented in this communication. The mechanisms and rhythms of integration to the economic strategies of the first animal and domestic plants and the variability of agricultural and livestock practices that supposed their adoption are emphasized. For this purpose, the synchrony in the adoption of the domestic species, the types of livestock exploitation and the degree of manipulation that domestic species show in relation to their wild counterparts are correlated. Moreover, the role of wild resources in the framework of the annual productive cycle is evaluated. Finally, variables such as the type of settlement, temporality of occupations and diversity of exploited resources are discussed in relation to early Neolithic organization of the economic activity.

10 THE INITIAL TRANSITION TO FARMING IN SOUTHERN CENTRAL EUROPE – A BRIEF SUMMARY OF THE CURRENT STATE OF AFFAIRS

Author: Professor Dr Gronenborn, Detlef - Roemisch-Germanisches Zentralmuseum
Co-Author: Dr. Haak, Wolfgang - Max Planck Institute for the Science of Human History (Presenting author)
Keywords: Linear Pottery Culture
Presentation Preference: Oral

Central Europe has – with the iconic Linear Pottery Culture – often served as one of the classic text-book examples for early farming societies. Research goes back to the later nineteenth century, and still continues up to the present day, now complemented by genetic data.
The paper gives a short overview of the current state of research in archaeology and related disciplines, in particular archeogenetics, with a focus on the period between 6200 cal BC and 5300 cal BC, encompassing the Late Mesolithic and the earliest phase of the Linear Pottery Culture. The transition in southern Central Europe is characterized by numerous regionally different scenarios with varying intensities of contact and exchange between incoming farmers of ultimately Near Eastern ancestry and hunter-gatherers of ultimately Pleistocene European or deep West Eurasian ancestry. With increasing numbers of prehistoric individuals at hand, for which we now have genome-wide data, we observe a complex picture of human interactions emerging, which range from early admixture to forms of extended co-existence in parallel societies.

11 THE CHARACTER OF THE EARLY NEOLITHIC FARMING. A VIEW FROM THE POLISH LOWLANDS

Author: Professor Marciniak, Arkadiusz - Adam Mickiewicz University (Presenting author)
Keywords: farming, Neolithic, fauna
Presentation Preference: Oral

Different proxies of problematic heuristic potential such as settlement location, lithics and stone implements, ethnographic analogies, species composition have been used until very recently to reconstruct the character of the Neolithic farming. The character of this evidence, in addition to a lack of any in-depths reflection on the nature of farming, made these reconstruction largely inadequate, simplistic and superficial. Recent developments in archaeological sciences, advancements in faunal studies, and theoretically deepened reflection of the complex nature of human-animal relations offer unprecedented possibilities to reconstruct the complex character of prehistoric husbandry and arable farming.

The paper aims to present a comprehensive overview of the character of husbandry practices of early Neolithic farmers inhabiting the lowlands of the North European Plain, as revealed by the newest body of research. The reconstructed aspects of husbandry practices comprise birthing place and season, diet, foddering, pasture location, seasonality of grazing, movement of domesticates across landscape as well as profile of production. This in-depth reconstruction of the nature of husbandry practices was possible thanks to the implementation of a multi-isotope approach, involving integrated analysis of stable isotopes of carbon, nitrogen, oxygen and strontium, advanced faunal studies, in particular age-at-death profiles, as well as aDNA and lipids analyses. An impact of the differentiated status of successive domesticates, such their position in folk taxonomy, role in the process identity construction or position in feasting practices, upon the character of their exploitation will be explicitly addressed.

12 FIRST FARMERS ON THE VISTULA RIVER IN THE POLISH LOWLANDS

Author: Dr. Pyzel, Joanna - University of Gdansk (Presenting author)
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Keywords: Neolithic farming, LBK,
Presentation Preference: Oral

First farmers that settled in the Polish Lowlands belonged to the Linear Pottery Culture (LBK). The Neolithic colonisation of the regions on the middle and lower Vistula belonged to the very vast and rapid expansion of this culture at the end of its oldest and the onset of its middle (Notenkopf) phase.
The study area represents the outermost northern range of the LBK world and lies outside the loess zone, preferred by the first farmers. The peculiarity of the LBK life in this area has been the subject of debates for a long time. In our presentation, which will focus the subsistence of the LBK societies in the Lowlands, we would like to join the ongoing discussion. We will consider the data from settlement analysis conducted on the micro-scale (internal layout of sites, their duration, architecture) as well as on the macro-scale (site location, especially in reference to soil types). We will only briefly mention husbandry practices as they will be discussed in detail by A. Marciniak in this session as well.
The main focus of our presentation will lie on the archaebotanical (carpological and anthracological) data from selected sites in Kuyavia which is a part of an ongoing project on the agriculture and palaeodietary development in the Neolithic and the Bronze Age. Important information on the plant economy of the first farmers brought especially the site Ludwinowo 7 where apart from einkorn chaff remains numerous seeds of Chenopodium AMS-dated to the LBK could be obtained.
We will compare these results with other LBK regions in the attempt to clarify the peculiarity of the LBK Lowland subsistence.

13 THE ROLE AND NATURE OF EARLY ANIMAL HUSBANDRY IN SECONDARY NEOLITHISATION: THE DUTCH AND EASTERN AEGEAN CASES IN COMPARATIVE PERSPECTIVE

Author: Prof. Raemakers, DCM - Groningen University
Co-Author: Dr. Cakirlar, Canan - Groningen University (Presenting author)
Keywords: Neolithic animal husbandry
Presentation Preference: Oral

We compare the role and nature of early animal husbandry in the eastern Aegean and the Dutch Delta, two regions of secondary Neolithisation. We compare first-hand insights and combine primary datasets from these two areas, which are typically considered in relation to their immediate neighbors. Earliest animal husbandry in the eastern Aegean is usually associated with full-scale herding by full-time agropastoralists whose origins are in the east, whereas earliest animal husbandry in the Dutch Delta is seen as small-scale efforts mostly by local hunter-gatherer-fishers. With this seemingly unlikely comparison, we hope to come closer to understanding the factors that influence the role and nature of animal husbandry in secondary Neolithic situations from a refreshing angle and with a critical assessment of the available datasets.

14 THE EARLIEST FARMING IN BRITAIN

Author: Professor Rowley-Conwy, Peter - Durham University (Presenting author)
Co-Author: Dr Gron, Kurt - Durham University; Dr Bishop, Rosie - University College Dublin; Ms Longford, Catherine - University of Sheffield
Keywords: Britain Neolithic farming
Presentation Preference: Oral

In this contribution we review the earliest evidence for agricultural practices in Britain. The earliest major monuments (causewayed enclosures, long barrows) date to after c. 3700 cal BC. Fewer than 10 animal bone assemblages date from the Earliest Neolithic (c. 4000-3700 cal BC), and all but one of these is dominated by domestic animals. A few directly dated cereal grains have produced dates falling into this period. Lipids in pottery have revealed the presence of dairying at the same time. Human bones are rare in this pre-monument period but the available evidence suggests a diet based on terrestrial plants. "Cereal-type" pollen is the only line of evidence suggesting agriculture earlier than c. 4000 cal BC, and appears increasingly anomalous when compares to the others. We review what this means for the nature of the earliest farming in Britain.

15 EXPLORING THE 'SOMEWHERE' AND 'SOMEONE' ELSE: AN INTEGRATED APPROACH TO IRELAND'S EARLIEST FARMING PRACTICE

Author: Dr SMYTH, Jessica - University College Dublin (Presenting author)
Co-Author: Dr McClatchie, Meriel - University College Dublin; Dr Warren, Graeme - University College Dublin
Keywords: Ireland Neolithic Multi-proxy
Presentation Preference: Oral

As an island on the westernmost edge of Europe, with few native wild predecessors of the main domesticated animal and crop species, the idea that farming arrived in Ireland from somewhere and someone else has rarely been contested. However, only recently have archaeologists begun to amass significant amounts of data on the specifics of the earliest crop and animal husbandry on the island. This has resulted in narratives that sometimes complement, and sometimes conflict with, existing models on the arrival of farming drawn from observations of the material culture record. In this paper we review multiple strands of evidence for what the earliest farming in Ireland looked like, combining results from the organic residue analysis of pottery, programmes of radiocarbon dating, and analysis of plant macro-remains, lithics and settlement remains. Together, these data provide greatly increased resolution on where these somewheres, and who these someones, may have been.

16 BIASED DATA OR HARD FACTS? HOW TO INTERPRET THE EARLIEST AGRARIAN EVIDENCES IN SOUTH SCANDINAVIA

Author: Sorensen, Lasse - The National Museum of Denmark (Presenting author)
Keywords: Ertebølle, neolithisation, scouts
Presentation Preference: Oral

Early evidence of agrarian activities from the late 5th millennium BC has often been used to argue for a long transitional process towards the emergence of agrarian societies. However, a recent survey of the earliest agrarian evidences have shown, that most of these presented data are biased and must be rejected within the discussion of the neolithisation process in South Scandinavia. Nevertheless a few agrarian evidences show their appearance within the late 5th millennium. How should we interpret these data? Could these early agrarian evidences in South Scandinavia be the results of hunter-gatherers visiting their neighboring farmers, thus arguing for long transitional process or the product of visiting scouts originating from Central European farming societies laying the foundation for a swift process through migration? The cluster of pioneering farmers located on easy arable soils, near considerable flint sources and in regions having a limited amount of hunter-gatherer sites indicates that agrarian scouts had chosen some optimal habitation for future migrations of Central European farmers. It is thus argued, that the introduction of agrarian practices was a swift process beginning around 4000 BC involving a leapfrog migration of Central European agrarian societies, which had direct or indirect connections with the Michelsberg Culture. Contemporary evidences from 4000-3700 BC also indicate a variable degree of continuity within the hunter-gatherers subsistence strategies on several coastal sites. How should we interpret the continuity on these coastal sites? Are we dealing with a population duality consisting of farmers living on easy arable soils and indigenous hunter-gatherers who settled the coastal zone or just one population commuting between coastal and inland zones? It remains an unsolved question.

17 EARLY NEOLITHIC FARMING IN SOUTHERN SCANDINAVIA

Author: Dr. Gron, Kurt - Durham University (Presenting author)
Co-Author: Dr. J. Church, Mike - Durham University; Dr. R. Gröcke, Darren - Durham University; Dr. Larsson, Mikael - Lund University; Dr. Sørensen, Lasse - National Museum of Denmark
Keywords: Scandinavia, Agriculture, Neolithic
Presentation Preference: Oral

The introduction of domesticated plants and animals into southern Scandinavia occurred at or around 4000 BC, concurrent with the start of the Funnel Beaker Culture in the region. However, there is little noticeable human impact upon the environment until around five hundred years later and despite much debate, questions remain over aspects of the transition to agriculture in the region, and particularly to the nature of the earliest farming. Recent research has focused on what agriculture was actually like in the earliest phase of the Neolithic, the Early Neolithic I (ENI, 4000-3500 BC) of the Funnel Beaker Culture. Stable isotope research investigating cattle management suggests the movement of animals, particular choice with regards to feeding environments for livestock, and manipulation of birth season. However, little is known about cereal cultivation during this early period. It is in this context that new carbon and nitrogen stable isotope data on carbonized cereals from EN sites in Sweden and Denmark are presented. Results suggest variation in crop management strategies, as well as evidence of manuring. In context with other lines of evidence, these data allow a new perspective on the earliest farming as an integrated package and offers lessons for understanding agricultural origins in the region.

18 CULTURE AND CONTEXT OF THE SCANDINAVIAN NEOLITHIC

Author: Professor Glorstad, Hakon - Museum of Cultural History, University of Oslo (Presenting author)
Keywords: Neolithic, Scandinavia, Culture
Presentation Preference: Oral

"A man is not defiled by what enters his mouth, but by what comes out of it". The words are Matthew's; their meaning belongs to us all. Research on early agriculture in Europe unfolds in the light of hindsight. Today we know that agriculture is of significant importance to European history. Such a blueprint was not available for those people that actually lived in the fourth and fifth millennium BC. Their horizon of choice and actions must have been very different form the factors we today consider important for the process of Neolithisation. Culture and indeed convictions of what is the best society or way of life must have been decisive for the way people responded to the fact that they needed food to survive. Such cultures and such convictions are interpersonal relations - what we think and choose to say and do. The significance of diet in such a fabric is not obvious and it must be questioned if modes of production, in a narrow sense of the term, can be given a superior value in the interpretation of the historical trajectory of the Neolithic.
The Scandinavian Neolithic is defined by several archaeological defined cultures. It is noticeable that clearly documented presence of agriculture varies considerably inside such a cultural framework. Through a few case studies the labile presence of agriculture on the Scandinavian Peninsula will be discussed. The final phase of the Neolithic is characterised by an overwhelming presence of evidence of farming and the main argument is that this final phase of the Neolithic represents a considerably different cultural and social context than the preceding social-cultural situations. Here, agriculture seems to have been an ideological choice as part of a larger ideological or political formation.

19 THE SLOW NEOLITHISATION: A CASE STUDY FROM WESTERN NORWAY

Author: Professor Bergsvik, Knut Andreas - University of Bergen (Presenting author)
Co-Author: Associate professor Olsen, Asle Bruen - University of Bergen; PhD student Halvorsen, Lene Synnøve - University of Bergen; Associate professor Hjelle, Kari Loe - University of Bergen
Keywords: Neolithic unimportant agriculture
Presentation Preference: Oral

In a new archaeological-botanical project on the introduction of agriculture in western Norway the hypothesis is that the adoption of cultivation and husbandry was a slow process, starting already around 3400 cal BC, perhaps even earlier. From then on, coastal sedentary hunter-fishers practiced agriculture close to their sites at a low level and on an experimental basis. It was kept at a low level until the late Neolithic around 2200 cal BC when agriculture had a major breakthrough in this region. To evaluate this hypothesis, regional artifact distributions, data from excavated sites, and new pollen investigations are presented.

The results open up for a discussion of the economic and social character and significance of the earliest, low-level agricultural practice in northern Europe, and also on the methodology we have for identifying it. During recent years, many have taken a critical stance on the evaluation of "weak" data on agriculture. But can we really expect the earliest, economically unimportant agriculture to be clearly and undisputably present in the pollen diagrams?

20 ONE SIZE DOES NOT FIT ALL? INTERPRETING COMPLEX DIACHRONIC NEOLITHIC-PERIOD DATA IN NORWAY

Author: Dr Prescott, Christopher - The Norwegian Institute in Rome, University of Oslo, Norway (Presenting author)
Keywords: Neolithic, Norway, Agro-pastoralism
Presentation Preference: Oral

Developments of prehistoric agro-pastoralism in Norway (and otherwise in Northern Europe) are readily interpreted as directional evolutionary patterns framed within models of Neolithication. However, there are ambiguities (not solely attributable to source critical factors) when patterns are examined over the 2000 years from the Early Neolithic (3950 BC) to the Early Bronze Age (1750 BC). The Early and Middle Neolithic A phases are archaeologically characterized by hunter-gatherer groups that had contact with agriculturalists, but chose not to adopt agricultural practices. The palynological data mirrors this, but also points to an opening of the landscape in numerous environments. With the transition to the Late Neolithic a fully developed farm institution (including upland transhumance) is established. This transition does not seem to be conditioned by preceding, long term developments. Can we make better sense of these patterns if interpretation does not start with the reigning model of Neolithication?

21 THE NORTHERN FRINGE OF EARLY FARMING IN EUROPE – INSIGHTS FROM ANCIENT GENOMES

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Keywords: aDNA, Neolithisation, Baltic
Presentation Preference: Oral

Here we present new genomic data from individuals dated to the Mesolithic to Late Neolithic from Scandinavia and the eastern Baltic to investigate the modes of transition from foraging to farming in these regions.
Previous ancient DNA studies have revealed that Neolithisation in Europe, starting around 6,000 BCE, was brought about by an expansion of farmers out of Anatolia, following the Danube and Mediterranean coast into Central and Southern Europe.
This development reached southern Scandinavia at around 4,000 BCE with the farmers of the Funnel Beaker Culture (TRB from German Trichterbecher) who introduced cereal cultivation and cattle rearing. Individuals attributed to the Middle Neolithic Megalithic TRB tradition of western Central Sweden, dating to a millennium after the first introduction of agriculture in the region, were previously shown to trace their ancestry back to Central European farmers, with substantial admixture from European hunter-gatherers. However, the question remained whether earliest Neolithisation in Sweden was driven by newcomers or by local groups involving later gene-flow from Central European farmers. Our data reveal that already the earliest Neolithisation process in Scandinavia was introduced by demic diffusion by Central European farmers with no detectable admixture from local foragers.
To the east of the Baltic Sea, hunting, gathering and fishing remained the basis of subsistence in the Early and Middle Neolithic and only sparse evidence of food production in the region during this period exists in Ceralia-type pollen and remains of domesticated animals. Our genome data indicate that eastern Baltic foragers retained the genetic profile of European hunter-gatherers until the Late Neolithic (2,900–2,300 BCE). A major shift in economy was only brought about with the arrival of steppe pastoralists who established new wide-reaching networks of contact within the Corded Ware Complex of Central and Northeastern Europe.

22 AGRICULTURAL DELAY IN THE EAST BALTIC. WHAT ARE THE REASONS FOR THIS?

Author: PhD student Grikpėdis, Mindaugas - Vilnius university (Presenting author)
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Keywords: Neolithic, agriculture
Presentation Preference: Oral

In Lithuania and the broader region of the Eastern Baltic the appearance of pottery in the 6th millennium BC traditionally mark beginning of Neolithic period, also known as "Forest Neolithic" or "Sub-Neolithic". Some researchers believe that neolithisation in Lithuania started shortly after the introduction of pottery and lasted for at least 2-3 millenniums. However the actual Neolithic package – stockbreeding and domestic plant cultivation is absent for several millenniums while subsistence strategies of local pottery making populations continues to be hunting, fishing and gathering wild plant resources. The past macrobotanical research reported the presence of cultivated plants from the 3rd millennium BC sites in western Lithuania, however, recent revaluations of this data has rejected those claims. It seems that agriculture in Lithuania and Eastern Baltic arrived much later than previously suggested. In this presentation we report an outline of early agriculture evidence from Lithuania and discuss the reasons for it's late introduction into Eastern Baltic.

219 PROOFS AND POSSIBILITIES: UNDERSTANDING THE ROLE OF EVIDENCE IN ARCHAEOLOGICAL RESEARCH

Theme: 6. Interpreting the archaeological record
Author: Ion, Alexandra (United Kingdom) - McDonald Institute for Archaeological Research,University of Cambridge
Co-Author(s): Ribeiro, Artur (Germany) - Graduate School "Human Development in Landscapes",University of Kiel
Keywords: evidence, archaeological record, trace, proof
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

In its desire to shape itself as an objective discipline, archaeology has been constantly marked by a reflection on its methods and ways of constructing the past. However, we think that the fundamental 'building-blocks' of our evidential regimes still deserve serious consideration, especially in the light of a change in styles of reasoning - from humanities to hard sciences analysis, each of them coming with its own understanding of evidence, truth, value.

A look into the history of the discipline reveals that our ideas of what is 'true' and 'evident' have been anything but assured. With this mind, we question whether it is possible/desirable, to think of archaeology beyond its 'hard evidence', to see if it can also become a discipline in which we ask whether a certain past could have been possible. As Carlo Ginzburg has suggested in history, we should be open to the idea that evidence serves not only as proof in favour or against a hypothesis but also as a past trace from which we can construct threads of narration which help orient ourselves through the labyrinth of reality. Thinking about time, proof and 'ruins' is inherent to archaeological thought, and taking Ginzburg's inquiry as a starting point, we are interested in papers which discuss the different ways in which these concepts are employed, how alternative conceptions challenge current ideas on the new materialist approaches, the role of semiotics in archaeological research, and ultimately, where the scientific boundaries lie with regards to archaeology as a discipline.

01 TRUE, FALSE, POSSIBLE: ARCHAEOLOGY AND THE "LABORATORY OF POSSIBILITIES"

Author: Dr. Ribeiro, Artur - Christian-Albrechts-Universitat (Presenting author)
Keywords: Possibilities, true, false
Presentation Preference: Oral

In some hard sciences, the scientist has the chance to conduct work within a laboratory in which a vast array of experiments can be performed. In many cases, scientific experiments fail to produce positive results and it is through trial-and-error that new 'discoveries' in the sciences come to the fore. With this in mind, if archaeology is perceived as a social science, what would an "archaeological laboratory" look like?

The aim of this talk is to suggest that archaeology does not need to follow a format in which assertions about the past have to be either absolutely proven true or false. As a discipline which strides the line separating the natural and social sciences, it is important for archaeology to also entertain assertions of what could have been possible in the past – a "laboratory of possibilities". As argued by Alessandro Manzoni and Carlo Ginzburg for history, archaeologists should be able to conceptualize contexts in which we can presuppose the many ways and the many choices available to actors at a given (pre)historical time without having to prove whether those choices did, in fact, take place.

Accepting an archaeology of "what could have been possible" forces us to revisit our preconceptions concerning social freedom, practice, and intentions. It is argued in this talk that in order for us to agree that past social actors were free and could act intentionally, requires also for us to agree that, in fact, it could have been entirely possible for actors to have made different choices in life – that they were, indeed, "free to choose otherwise".

02 VAGUENESS AND ARCHAEOLOGICAL INTERPRETATION: AN ABDUCTIVIST ACCOUNT

Author: Mr Marila, Marko - University of Helsinki (Presenting author)
Keywords: abduction, empiricism, vagueness
Presentation Preference: Oral

The rapid development of natural scientific methods coupled with the recent popularity of object-oriented philosophies and new materialisms in archaeological theory has raised discussion about the possibility of a return to empiricism in archaeology. While empiricism as a pragmatic philosophy is in line with archaeology's hands-on character, the recent development has left some concerned about the vanishing role of vagueness and ambiguity in archaeological interpretation. In this setting, the exactitude of natural scientific methodology is seen as a 'mechanism of closure' that presents complex data in simple representations, and in doing so compromises the tacit dimensions of archaeological knowledge.

Drawing my inspiration from such empiricist philosophies as speculative realism and classic pragmatism, I propose something along the lines of a 'speculative pragmatism' (Rosenthal 1986) in archaeology's epistemology. Such an approach relies heavily on abductive inference as vague low-level hypothesis formation. Abduction highlights the embodied, speculative, and open-ended nature of scientific inquiry, and welcomes intuition and creativity as important parts of it. A creative researcher is able to see a variety of possible connections between the studied materials and imagine a more diverse collection of possibly fruitful explanations for and interpretations of them.

03 THE SOCIAL CONSTRUCTION OF PAST – EVIDENCE AND NARRATIVES IN ARCHAEOLOGY USING THE EXAMPLE OF EARLIEST CHURCHES IN ALEMANNIA

Author: Werner, Michael - Albert-Ludwigs-Universität Freiburg (Presenting author)
Keywords: social-constructivism, epistemology, narrative
Presentation Preference: Oral

Based on Berger and Luckman's "The Social Construction of Reality" one can formulate following deliberation, concerning the (re-)construction of the past from archaeological material. By exploring and interpreting the past, processes of construction happen on three different levels.
On a level of sociology of knowledge, each reality is constructed by its inhabitants through the externalisation of ideas and understandings. In doing so, the creation of material culture is significant. On a material level, our sources are throughout constructed as well. They are man-made in literal understanding. But they are also constructed in terms of being externalisations of ideas. Finally, on an epistemological level, we as archaeologists construct a description of a past reality which matches our sources. But which is not identical with past reality and neither is to be regarded as plenary objective. In a constructivist view, 'appropriate descriptions,' in a sense of being descriptions matching our sources, open up the possibility of several, equally 'correct' interpretations of one phenomenon. However, it is crucial to stress the importance of formulating descriptions and narratives, which are indeed matching the evidence, in order to avoid the criticism of arbitrariness.
As a practical example, the current state of research concerning earliest churches in Alemannia was examined. Here, the traditional narrative of the Frankish 'integration' of Alemannia during the 6th century, lead to the presumption of first churches, dating as early as the 6th century. However, definite archaeological evidence of these structures is hard to find. In more recent research, there are major doubts, concerning the existence of such edifices before the 8th century. This is presented as a negative example of a traditional narrative, which seems to have been so commanding, that archaeological evidence was interpreted in a way to match the description, rather than to adapt the description to the evidence.

04 PROOFS, PROBABILITIES, POSSIBILITIES: MIRROR, MAGIC, AND MYSTERIES. – HOW FAR CAN WE GO?

Author: Professor Dr Lindstrøm, Torill Christine - University of Bergen (Presenting author)
Keywords: Evidence, Science, Pompeii
Presentation Preference: Oral

In the Great Fresco in Villa of the Mysteries in Pompeii, Italy, there is painted an extraordinary mirror. Taking a micro-historical perspective, (according to Carlo Ginzburg), I will explore this one object on several theoretical and methodological levels: I will present hard data proofs that such mirrors actually existed and were used; I will present cultural-historical probabilities regarding their extended practical uses and metaphorical functions; I will present probable semiotic functions of the mirror in the Great Fresco of Villa of the Mysteries; and finally, I will present psychological processes that possibly explain the mirror's uses and functions, both in this particular case and in the general cultural context. And I will show how the last element, the psychological processes can throw light backwards on the hard-data proofs and cultural-historical probabilities. – Instead of making a theoretical discussion, I give a narrative of a single object, and carefully differentiate the scientific boundaries between the three Ps of evidence in archaeological research: the Possible, the Probable and the Proof.

05 PROOFS AS POSSIBILITIES: INTERROGATING INTERDISCIPLINARY APPROACHES TO THE STUDY OF HUMAN REMAINS IN (OSTEO)ARCHAEOLOGY

Author: Dr Ion, Alexandra - McDonald Institute for Archaeological Research (University of Cambridge) (Presenting author)
Keywords: bones, (osteo)archaeology, interdisciplinarity
Presentation Preference: Oral

By taking the case study of a couple of human remains discovered in a Neolithic site from the Balkan area, I aim to re-evaluate the implications of using different kinds of data in contemporary accounts of funerary discoveries. I claim that interdisciplinarity in archaeology should be critically evaluated when it comes to the understanding of body, as the widening array of methodologies and types of data employed to capture the multi-dimensional nature of the material record (e.g.isotopes, archaeogenetics, osteological data, agency theories) brings forth incompatible values and parameters of these analysis. This also opens a discussion on how objectivity has become assimilated in archaeology with the 'mathematical' procedures. I will establish how different framings of the dead body are produced between the humanities and the natural sciences and by doing so further examine what Robb and Harris (2013) have referred to as a crisis in contemporary understandings of the body, where the move between disciplines is a move between ontological premises of what the body is. I propose that Carlo Ginzburg's microhistorical approach offers a solution: a way to link singular discoveries with larger contexts, to move beyond the need to choose between the repetitive/typical or the localised information; "To select as a cognitive object only what is repetitive, and therefore capable of being serialized, signifies paying a very high price in cognitive terms." wrote Ginzburg, and his inquiry into clues and conjectures offers a way to approach the ever fragmentary and heterogenous nature of the archaeological record. (This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Sklodowska-Curie grant agreement No 701230)

06 THE USE OF NATURAL SCIENTIFIC EVIDENCE IN THE INTERPRETATION OF PAST CULTURAL BEHAVIOUR

Author: Kokkov, Kristin - University of Tartu (Presenting author)
Keywords: evidential reasoning, interpretation
Presentation Preference: Oral

The purpose of this paper is to analyse the structure of evidential reasoning in archaeology in reference to natural scientific evidence. Archaeology is a highly interdisciplinary subject field since archaeologists constantly use methods and theories from other scientific areas to study and interpret archaeological material. These methods and theories borrowed from natural sciences are independent of the archaeological research questions about the social structures and cultural dynamics that are the primary focus of investigation.
Alison Wylie (2011: 385) argues that external technical resources are expected to raise evidential claims to a new level of security. However, Wylie (2011: 371) admits that there is a gap between the results of natural scientific research and the interpretive claims about past cultural behaviour. This gives rise to the question how do natural scientific methods operate in the process of evidential reasoning in archaeology. More precisely, how are the objective and general scientific facts turned into interpretive evidence about past people's cultural interaction?
Wylie (2011) points out that evidential reasoning model in archaeological interpretation involves at least three functional components: 1) various kinds of empirical data; 2) theory that mediates the interpretation of data as evidence; and 3) the claims on which this empirical data bear as evidence.
Relying on Wylie's model of evidential reasoning, I will explain in detail how the scientific facts are turned into cultural evidence, and show in what part of the reasoning process this transformation occurs. My analysis aims to provide new insight into the process of forming coherent interpretation of the past.

Reference
Wylie, Alison 2011. Critical Distance: Stabilising Evidential Claims in Archaeology, in Philip Dawid, William Twining, Mimi Vasilaki (Eds.) Evidence, Inference and Enquiry. Oxford, New York: Oxford University Press, 371–394.

07 PLAUSIBILITY MATTERS

Author: Meier, Thomas - Ruprecht-Karls-University Heidelberg (Presenting author)
Keywords: narratology, laboratory-studies, plot
Presentation Preference: Oral

In the 1970s Hayden White sparked a fierce debate on the narratological structure of historical writing. Since then we have realised that the construction of truth and evidence in the humanities largely depends on the structure of the plot which arranges the selection and order of „facts" and their interrelations. Around the same time laboratory studies started to open our eyes that in the sciences truth, evidence and proof are likewise not out there, but are produced by specific settings of the research community.
While the constructivist nature of proof-production in the laboratory has been addressed rather clearly, much of the debate in the humanities circles around the non-/literary, i.e. non-/fictional character of academic writing. But in both academic cultures little reflection is paid to the question, which kinds of laboratory arrangements or narratological plots are accepted by the scientific community and which are rejected.
In this paper I opt for more reflection on the silent assumptions of plausibility, which govern laboratories and narrations. They are determined by a culturally dependent worldview, which has produced the modern, western academic perspective, but is hardly shared by other cultures. Becoming aware of the cultural dependency of proofs and evidences opens the field for new and other possibilities of historical/archaeological narrating. This also regards the „reading" of traces as I shall exemplify by a horse's trace.

224 RE-THINKING HOW EUROPEAN CONTRACT ARCHAEOLOGY CAN BEST CONTRIBUTE TO SOCIETY

Theme: 2. The Valletta Convention: the next 25 years
Author: Högberg, Anders (Sweden) - Linnaeus University
Co-Author(s): Holtorf, Cornelius (Sweden) - Linnaeus UniversitySchlanger, Nathan (France) - École nationale des chartes ParisKars, Eva (Netherlands) - EARTH Integrated Archaeology, AmersfoortBazelmans, Jos (Netherlands) - Cultural Heritage Agency of the Netherlands, Amerfoort
Keywords: new knowledge, societal impact, development
Presentation Preference: Session with papers of six minutes and six slides

Less than two decades ago, contract archaeology in many countries was nearly entirely development-led or state-controlled. Today it is a competitive business. In many countries this has resulted in an unambitious but cheap archaeology that lacks social impact. At the same time European archaeology is increasingly evaluated for its ability to meet society's needs.
These converging trends mean that there is an increasing need for capacity-building in advanced research skills in order for archaeology to make substantial contributions to society. In this session we will present short papers that explore European contract archaeology in relation to its social impact. We particular invite papers that include discussions of the following topics:
How much and which knowledge about the past does society need? What is the value of that knowledge? Which needs other than knowledge about the past can archaeology meet?
To what extent can contract archaeology contribute to meeting significant societal challenges including conflict resolution and social cohesion, economic regeneration and sustainable development, continuing education and democratization of society?
Which indicators can be used to define and measure the quality of projects in contract archaeology, with societal impact in mind?
How can contract archaeology define cutting-edge research questions and develop cost-effective ways of answering them for the benefit of society at large?
What does it mean to compete with knowledge about the past made available to society?
How can the existing demand for archaeology in society increase, new products/services develop and new markets for business be found?

01 WHAT DOES IT MEAN FOR CONTRACT ARCHAEOLOGY TO CONTRIBUTE TO SOCIETY?

Author: Professor Högberg, Anders - GRASCA, Linnaeus University; University of Johannesburg (Presenting author)
Co-Author: Professor Holtorf, Cornelius - GRASCA, Linnaeus University
Keywords: Social impact archaeology
Presentation Preference: Oral

More and more, European archaeology is judged from its ability to meet society's needs and its impact on society at large, as evident from for example communication documents on cultural heritage from the Commission of the European Parliament. Consequently, there is an increasing need for capacity-building in order for contract archaeology to make substantial contributions to society.
However, the sector of contract archaeology is currently lacking adequate knowledge on how to extend its potential to contribute meaningfully to societal development, both generally and in relation to specific audiences. There is also insufficient knowledge on how to assess its impact in society (qualitatively) and measure its concrete benefits (quantitatively). High competency in contemporary archaeological research and practices of meaningful social engagement is paramount.
In this paper we discuss what it might mean for contract archaeology to contribute to society, beyond operating as part of a regulatory system or providing interpretation of the past based on results from excavation. By offering some food for thought, our aim is to set out the agenda for the session.

02 UNDERSTANDING CONFLICT BEHAVIOR - DEAD BODIES AS MANIFESTATIONS

Author: PhD Candidate Alfsdotter, Clara - GRASCA, Linnaeus University; Bohusläns Museum (Presenting author)
Keywords: Conflict theory violence
Presentation Preference: Oral

In my research, I want to explore how people in the past and today use dead bodies from intra group conflicts as manifestations in society.

The dead body constitute a sociocultural symbol. Within bioarchaeology, analysis of human remains from conflicts have mainly been descriptive rather than explanatory of a human behavior. Integration of theories on human behavior and social implications of violence and conflicts needs to be included. Collective violence cannot be understood through a narrow analysis since it happens in relation to a complex sociocultural arena.

In this paper I will discuss the importance of understanding violence from an anthropological perspective in order to try explain its uses and conditions. A bioarchaeological perspective can fruitfully be used to both create data through studying the material traces of interpersonal violence on skeletons and integrate social theoretical frameworks to understand the use and effects of violence, both in ancient and contemporary populations.

The bioarchaeological and archaeological knowledge on the matter is not only important in order to further understand the consequences and uses of violence and the human behavior, but also to use these perspectives as tools for contemporary society to discuss and get perspectives on ongoing similar matters. The archaeological knowledge can be translated into contemporary discussions by providing both the historical perspective but also an understanding of fundamental human traits regarding the causes and consequences of conflict.

03 ALIVE; DIGITAL KNOWLEDGE DEVELOPMENT AND COMMUNICATION IN CONTRACT ARCHAEOLOGY.

Author: PhD Candidate Mr Gunnarsson, Fredrik - GRASCA, Linnaeus University; Department of Museum Archaeology, Kalmar County Museum (Presenting author)
Keywords: Digitisation, Contract Archaeology
Presentation Preference: Oral

This paper discusses the level of impact that the digitisation brings to contract archaeology in Europe and how knowledge development and communication can see further progress, using it.
The digitisation of European contract archaeology takes place on many levels and is becoming increasingly important to e.g. field documentation, analysis and public outreach. With digitisation, new possibilities arise to improve efficiency in work flows and create new markets. It also creates a more open landscape in a competitive business were sharing doesn't come easy. How can digitisation improve contract archaeology businesses, while at the same time produce better research material for the future?
The Valletta and Faro conventions highlights the need for European archaeology to make a societal contribution and the sector of contract archaeology has the responsibility to curate digital data and make it relevant both for researchers and society. Better developed communication flows, more closely interlinked with documentation and interpretation, will shape a more open archaeological process. These flows have the potential to make knowledge produced by contract archaeology not only survive, but also come alive.

04 THE PRODUCTION OF KNOWLEDGE WITHIN DUTCH CONTRACT ARCHAEOLOGY: THE LONG TRADITION OF CRAFTSMANSHIP AS A DOMINANT PARADIGM

Author: Prof.dr. BAZELMANS, JOS - Cultural Heritage Agency of the Netherlands (Presenting author)
Co-Author: Dr. Kars, Eva - EARTH INTEGRATED ARCHAEOLOGY
Keywords: Netherlands craftmanship fieldwork
Presentation Preference: Oral

As in most European countries the introduction of the developer pays-principle put the issue of the balance sheet of costs and benefits at the forefront of public discussions concerning archaeology. In this context Dutch archaeology in general and Dutch contract archaeology had and has to refocus itself on societal impact and societal needs as to ensure its long-term survival. This should, the authors think, entail, amongst other issues, a critical evaluation of knowledge production in Dutch archaeology and in Dutch field work traditions in archaeology. A major drawback of Dutch archaeology is the conceptual and organisational division between field work on the one hand and research, interpretation and writing up on the other hand. As from the start in the early twentieth century up until today archaeological field work is considered to be an act of craftsmanship to be delegated to technicians. To the contrary post-excavation activities are being done by highly trained archaeologists. This stance has been enshrined in the Dutch quality system for archaeology and in the staffing of excavations. Needless to say that this division counteracts an intimate and fruitful interplay between researchers within and outside of the field and that this division acts as a hindrance to producing evocative images of the past.

05 ARCHAEOLOGICAL SYNTHESIS AS CONDITION TO CONTRIBUTE TO SOCIETY

Author: Drs Eerden, monique - Rijksdienst voor het Cultureel Erfgoed (Presenting author)
Keywords: synthese, contract-archaeology, Netherlands
Presentation Preference: Oral

The Valletta Convention (article1) regulates the protection of the archaeological heritage as source for new knowledge about our past. New knowledge on the basis of which new meaningful stories about our past can be told. That's what archaeologists have to offer to society.

Condition to tell new meaningful stories to society is that development-led reports are synthesised.
Incentive for the dutch national government to generate resources for synthesising research was to improve the dutch archaeological heritage practice. How this type of synthesising research is organized in the Netherlands will be discussed in this contribution. This wil be controlled by confronting questions from the National Archaeological research Agenda with the range of development-led archaeological reports. This research is mainly carried out by archaeological companies and universities.
Translating these stories to the public is not a task of the Cultural Heritage Agency in the Netherlands but is mainly a task for private initiative

06 WHAT ABOUT THE CONTENT?

Author: PhD Candidate Dutra Leivas, Ivonne - GRASCA - Linnaeus University; Kalmar County Museum (Presenting author)
Keywords: Contract-, Public archaeology
Presentation Preference: Oral

Humanities, and indeed the whole cultural heritage sector, have for the past two decades been strongly affected by globalization and, as a consequence, forced to reconsider the role it will play in society to maintain its legitimacy and social relevance. The altered conditions for the cultural heritage sector in Sweden was followed by a heated debate about the importance of archeology and its role in society. Since contract archeology was questioned because of its costs, the demands on contract archeology increased to benefit society and the public. This is where mediation of archaeological results to the public and other audiences enters the scene of contract archaeology. Still, almost 20 years later, the Swedish sector of contract archaeology is uncertain of its aims in public archaeology. Therefore, there is an urgent need of heightened awareness about contract archaeology's public domain, and what it should be about and encompass.

Although there are now higher demands on public archaeology, the objective wordings in guidelines and policy documents are still very vague. This results in quantitative mediation forms where the goal is to reach as many groups of audiences as possible. Qualitative values in archaeology, for example to increase people's awareness of archeology and history and their role in society, gets to some extent a secondary role in the practices of mediation. To work against a one-sided or an underbalanced public archaeology, the sector of contract archaeology must dare to ask their audiences what they expect from contract archaeology. Furthermore, contract archaeology needs to a greater degree approach a public archaeology with a focus on the communicative aspects concerning questions about what is mediated and how it is mediated. This should be both fruitful and instructionally relevant in contract archeology.

07 WHOSE (MARITIME) ARCHAEOLOGY IS IT ANYWAY?

Author: PhD Candidate Ni Chiobhain Enqvist, Delia - GRASCA, Linnaeus University; Bohusläns museum (Presenting author)
Keywords: contract maritime digital
Presentation Preference: Oral

Access to cultural heritage is both recommended by and the basis of many conventions on cultural heritage, such as Faro and Valetta. In the case of submerged cultural heritage the 2001 UNESCO Convention highlights the importance of access, while also recommending in situ preservation, setting the tone for the discipline of maritime archaeology's current dominant practice.
The adoption of digital methodologies in maritime archaeology is thus a natural reaction to calls for archaeological results to be accessible to non-experts, while also contributing to efficiency to the contract sector.
However, the prevailing use of digital techniques by maritime archaeologists has resulted in many older methodologies simply turning digital, circumnavigating any critical analysis on the methodologies themselves, what precisely they are communicating and to whom the information is to be conveyed.
Specifically, what has been ignored during this digital shift are long held critiques of the maritime discipline that include technological fetishism and a narrow masculinist perspective of the past. These narratives are unquestioningly communicated to non-expert audiences.
Archaeological results can never truly be of relevance of benefit to society if the narratives are created by an expert few whose visual narratives are heavily influenced by both personal and discipline-wide biases and research agendas.
This is resulting in a failure to realise the full potential of the multiple approaches to both experience and narrate maritime archaeology, as well as the full potential of these technologies for visualisation purposes.

08 CONCLUDING DISCUSSION

Author: Dr Schlanger, Nathan - Ecole nationale des chartes (Presenting author)
Keywords: Archaeology, private, public
Presentation Preference: Oral

Taking account of the various views presented, this brief concluding discussion will attempt to prise out some general propositions on the relations between contract archaeology and society.

09 WHEN PEOPLE MATTER. SUSTAINABLE URBAN DEVELOPMENT FROM HERITAGE AND ARCHAEOLOGY.

Author: PhD Candidate Söderström, Ulrika - GRASCA, Linnaeus University (Presenting author)
Keywords: archaeology, sustainability, development
Presentation Preference: Oral

Addressing the issue of how the contract archaeology sector could fulfil and extend its potential to contribute meaningfully to societal development, generally and in relation to specific audiences, requires taking a stand on sustainability and sustainable urban development. One may very well argue that there are several ways in which cultural heritage and archaeology contribute to and affect a sustainable urban development. However, advanced research supporting such a theory is still scarce, particularly when it comes to archaeology.

This poster will present part of my ongoing PhD research project Excavating a sustainable future, conducted within the research school GRASCA at Linnaeus University in Kalmar. The purpose of the project is to examine how a use of heritage and archaeological knowledge in contemporary urban planning and rural development can contribute to and promote a sustainable development of cities and communities. In this poster presentation, I will address the topic of how to maximize societal impact in contract archaeology by briefly discussing two specific examples were such an impact could be measured in relation to sustainability issues such as social cohesion, economic regeneration and sustainable urban development.

10 THE SYNERGY EFFECT BETWEEN CONTRACT ARCHAEOLOGY COMMISSION-BASED CONSERVATION AND THE MUSEUM

Author: PhD Candidate Smits, Vivian - GRASCA, Linnaeus University; Studio Västsvensk Konservering, Västarvet (Presenting author)
Keywords: heritage communication stakeholders
Presentation Preference: Oral

As a part of the GRASCA project, one of the main objectives of my research aims to deploy optimal efficacy in communicating the past through optimizing the cooperation between archaeologist, conservator-restorer and museum. For that purpose I study how contract archaeology has and is affecting museum collections, how museums are using the heritage of archaeological research, and how communication between stakeholders can be enhanced and improved in order to meet everyone's interests in the most suitable way.

11 WORKING TOWARDS A STANDARD FOR RESOURCE AND PREDICTIVE MAPS FOR LOCAL AUTHORITIES

Author: Drs/ msc Speleers, Barbara - cultural heritage agency the Netherlands (Presenting author)
Keywords: authorities, commercial archaeology
Presentation Preference: Oral

Since 2007, virtually all local authorities in the Netherlands have used archaeological resource maps, predictive archaeological maps and policy maps to help them meet their responsibility for heritage management. Most of the maps have been compiled by commercial archaeological agencies. The predictive archaeological maps are based on predictive modelling combined with expert judgment. It is often unclear what predictions are actually based on. It was found that, when maps are fitted together, they do not match well in terms of either form or content. Differences between maps raise questions when it comes to projects that straddle municipal boundaries. The discrepancies are associated with the almost complete lack of overall detailed guidelines for map production, differences in the predictive models used, the sources consulted, the design and conditions imposed

by the authorities commissioning the maps, as well as in the financial resources available. The awareness that creating guidelines will improve quality and uniformity in the maps bring all parties together, in which commercial archaeological agencies took the first step.

12 HOW WE GOT MURDERERS: THE RISE AND FALL OF ITALIAN ARCHAEOLOGISTS

Author: Phd Pintucci, Alessandro - Confederazione Italiana Archeologi; Topografia Archeologica Scarl (Presenting author)
Keywords: Preventive-archaeology, delays, professionals
Presentation Preference: Oral

In July 2016 a serious train accident, in Puglia, southern Italy, caused 23 dead and 53 wounded: the next day, the national newspaper "Libero" published a front-page headline in which responsibility was given to activities of preventive archaeology, which had slowed the modernization of the railway in the area where the accident had happened. Starting from this case, the author will try to illustrate how the general public see in this moment the archaeological activities, recounting briefly the historical and cultural reasons of the bad fame of archaeology in Italy.

13 EVERYBODY LOVES ARCHAEOLOGY, BUT NOT IN THE GARDEN OF HIS OWN.

Author: PhDr., Ph.D. Bures, Michal - Archeo Pro o.p.s. (Presenting author)
Keywords: archaeology social impact
Presentation Preference: Oral

The history of development-led archeology in Czech Republic goes back to 1970´s. Public respect of contract archaeology came much more later - in 1990´s - with the archaeologists ability to define the value of archaeological heritage in terms of money. Recently society expectations are concerned mainly with new discoveries, but also with feeling, that specialists are taking care for their heritage. It does not always fits together with the happiness of having archaeology in the garden. Some of those, who have no gardens, are thankful to contract archaeologists for occasional job.

225 MEETING US. HERITAGE, CULTURAL IDENTITY, AND NEWCOMERS IN EUROPE IN THE 21ST CENTURY

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Colomer, Laia (Sweden) - Linnaeus University
Co-Author(s): Catalani, Anna (United Kingdom) - University of Lincoln
Keywords: migration, communities, newcomers, identity, heritage
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Globalisation, the refugee crisis and mobility inside the EU are creating a distinctive picture of Europe today. Since the Maastricht Treaty, the EC has actively sponsored programmes that enhance the mobility of citizens, either via job recruitment, academic research, regional development, or education. This mobility has resulted into intercultural and transnational working synergies, supported also by the migration of professionals and families. Additionally, Internet and global communication broadcasting have made the local, the exotic and the global an integral part of our daily life. Furthermore, the recent refugee crisis, alongside with the arrival of extra-communitarian citizens (both from developing and developed countries), are both pluralizing the cultural profile of today's European residents and diversifies its social and cultural dynamics.

Within this timely and challenging context, we would like to explore how new cultural identities in transformation are challenging the notions and significance of archaeological heritage today. Hence, this session aims to address the following questions: how are the current authorised heritage discourses in Europe changing, due to the contemporary processes of migration and globalization? How can heritage sites and archaeological collections be a meeting point for socio-cultural dialogue between locals and newcomers? How can heritage sites and archaeological collections be creative platforms for other heritage discourses, better 'in tune' with today's European multicultural profile? This session invites thus papers that explore, analyse and discuss these questions, especially through a transdisciplinary approach.

01 HERITAGE, IDENTITY AND REFUGEES IN THE 21ST CENTURY EUROPE

Author: DR CATALANI, ANNA - University of Lincoln, UK (Presenting author)
Keywords: Heritage, migration, identity
Presentation Preference: Oral

This paper considers how the notions and definitions of heritage are changing, due to the recent and ongoing forced migrations from Africa and the Middle East to Europe. The recent 'Refugees crisis' has highlighted not only the depth of a vast humanitarian crisis but also a complex sociocultural phenomenon that will have an impact on the way cultural heritage is defined, interpreted and used by local (both hosted and host) communities in Europe to forge new cultural and collective identities. As human beings, we desire to feel attached to and to be rooted in a place. However, when individuals or entire cultural groups are forced to leave their own homes and countries and resettle into another nation, a deep sense of estrangement and nostalgia become predominant. Museums and other cultural institutions can, certainly, support refugee groups and forced migrants in overcoming this estrangement, by assisting them to recreate a sense of place and negotiate their identities. Nevertheless, in order to do so, it is essential that cultural organisations understand the new forms of diasporic heritage so that they can construct new narratives of belonging and identity.

Throughout this paper, I will look at the changing notions and perception of heritage, through diasporic imagination and in the era of mass migration: the concept of 'diasporic imagination' will be used to indicate the reinterpretation of the past through the experienced memories of displacement. I argue that the current forced migration is the beginning of a new heritage paradigm, which would need, once again, a new cultural and civic recognition in museums and other heritage institutions. Within this paradigm, diasporic imagination is a key element because it triggers a positive process of memory recollection and identity redefinition that allows refugee groups to culturally re-assert their history, memory and traditions in the hosting context.

02 EXCEPTION OR NORMALIZATION? AN ARCHAEOLOGY OF THE 'CENTROS DE INTERNAMIENTO DE EXTRANJEROS' IN SPAIN

Author: Mr. Gomes-Coelho, Rui - Cultural Heritage and Preservation Studies, Rutgers University, USADr. Marín Suárez, Carlos - Centro de Estudios e Investigaciones en Arqueología y Memoria, CEAM-UNRDr. Tejerizo-García, Carlos - Institute of Heritage Sciences (Incipit, CSIC) (Presenting author)
Co-Author: Mr. Fermín-Maguire, Pedro Pablo - Universidade Federal de Minas Gerais
Keywords: CIEs, immigration, capitalism
Presentation Preference: Oral

As part of a common process within the nation states of the European Union, since the incorporation of Spain to the Schengen space, different governments have implemented the subsequent migratory policies. These have included the creation of the 'Centro de Internamiento de Extranjeros' (CIEs; centres for the internment of foreigners), as in many countries all along the European territory. In Spain, nine of these centres have been created in total, seven still fully functioning today and receiving more than 11000 individuals a year. The rapidity and improvisation of this process in Spain has led to reusing old spaces. These centres operate at police headquarters or even prisons, previously repressive spaces which have contributed to dehumanize and objectify others, and to create true 'pain archipelagos'. Despite the evident difficulties for gathering data about these centres, we will explore the possibilities and limits for an archaeological study of the CIEs in to place them within the current state of capitalism, and, as a way of constructing new ways of critique and to encourage political reaction against them. Thus, we will argue that the presence of CIEs is an intrinsic part of current capitalism and its need to normalize the exceptional, and to justify political and economic repression by creating a specific form of 'otherness'.

03 BEYOND COLLECTIVE ORIGINS: ALTERNATIVE ARCHAEOLOGICAL NARRATIVES FOR GLOBAL CITIZENS OF THE 21ST CENTURY

Author: Professor Dr Holtorf, Cornelius - Linnaeus University (Presenting author)
Keywords: futures, narratives, globalism
Presentation Preference: Oral

Archaeology was born from a concern with the origin of distinct racial or ethnic groups in a given territory. Many groups still see strategic uses of archaeology for supporting their seemingly best collective interests. Arguably, however, the contemporary globalized world in which people are increasingly interconnected across borders through a global economy, a global culture, global environmental changes, and global migrations, among other factors, put ever bigger question marks behind exclusively owned ethnic identities, histories and territories. Assuming that these trends will continue, where will that leave Archaeology for the rest for this century? In this discussion paper I will present several possible alternative narratives for archaeology: about irony (rather than seriousness); about practice (rather than outcomes); about hybridity (rather than purity); about individuals (rather than collectives); about the future (rather than the past).

04 WHERE DO I PLACE MY MEMORIES? THE ARCHAEOLOGY OF COMMEMORATING THE MEMORIES OF POLITICAL REFUGEES.

Author: Dr Colomer, Laia - Linnaeus University (Presenting author)
Keywords: street-names, heritage, human-rights
Presentation Preference: Oral

All societies face the question of how to deal with past memories, especially painful memories. Monuments and memorial places are spaces where the country memories converge, summarize, counter and define relationships between past, present and future. They serve thus to reinforce current social contracts between different generations. However, current migration flows set a distinctive scenario: political refugees, especially, become new citizens of nation-states which, first, have heritage places that commemorate events that signify nothing to them, and after, do not have any commemoration place related to the conflict that generate their refugee's condition. So, the question is whether memories refer to the land of nation-states or to its citizens, both to those long-time established and to the newcomers. In order to discuss these issues, my paper will pay attention to street names as a type of low-profile commemoration and memory heritage places. I will argue that street names might be both a trivial and a counter public place, but relevant here they may help to integrate newcomers' memories into the local commemoration landscape. To exemplify my arguments I will introduce Barcelona's civic participative process to designate its street names, and I will focus on two specific areas of significance for Argentinean and Chilean political refugees from the 70s-80s. I will discuss then how these low-profile commemoration places assist in the process of recalling newcomers' past and, specially, become a civic reference for the immediate present, and a vision on what the city aims to be in the future.

05 HERITAGE PROJECTS IN MULTICULTURAL SCHOOLS: A PLACE TO MEET

Author: Masriera, Clara - Universitat Autonoma de Barcelona (Presenting author)
Keywords: schools, multiculturality, heritage
Presentation Preference: Oral

Nowadays, schools are not longer considered as mere transmissors of factual knowledge and disciplinary competences, but as the first context for the learning of social competences outside the household. In many recent educational reforms through Europe, contents about attitudes and values have been included and education for what is called democratic citizenship is becoming – not without a great deal of discussion of its contents and aims - a generalized school subject.
It is in this sense that we argue for the creation of heritage experiences understood as the selection of material or immaterial cultural elements not previously considered as heritage elements in terms of quotidian significance to become shared identity references for students and families of multicultural schools. And we argue too for this reappropriation of heritage (reinterpretation of heritage elements, in terms of common experiences and identity requirements) as a necessary redefinition of the notion of heritage in educational contexts.
This heritage creation or appropriation appears to be sensitive to the notion of democratic rights, duties and ways of coexistence. The acceptation and assumption of a common heritage requires mutual agreement on a common base – searching for what is shared and acknowledging what differs. Therefore it fosters respectful interpersonal relations and the value of dialogue and cooperation. Moreover, the projection of this common heritage outside school amplifies the dialog with families, cultural groups and administration instances, defending it as a new created common cultural right.
To illustrate this argument, different experiences of Catalan primary schools will be presented, detailing procedures, development and impact of heritage related projects.

06 THE ASSEMBLY OF SOUTH AFRICAN ARCHAEOLOGICAL HERITAGE AT THE BRITISH MUSEUM: DO TRANS-PLACED OBJECTS CONTRIBUTE TO A SHARED TEMPORAL IDENTITY?

Author: Dr. Königk, Raymund - University of Lincoln
Co-Author: Ms van der Wath, Elana - University of Lincoln (Presenting author)
Keywords: ensemble, identity, migration
Presentation Preference: Oral

In this study we consider how our heritage is reshaped due to globalisation by referring to three archaeological artefacts included in the British Museum's recent exhibition, 'South Africa: the art of a nation': the Makapansgat Pebble of Many Faces (3,000,000 BP); the Mapungubwe Rhinoceros (1250-90); and the Linton Panel (pre-1900). As 'newcomers in Europe' we will use this paper to reflect on our heritage in a European context: how does the display of our archaeological heritage affect our sense of self, our sense of place, our sense of community (African or European), and our sense of citizenship and belonging (South African or global)?

Interior designers can produce meaningful arrangements by placing found objects in close proximity to create ensembles; ensembles are further commonly used to structure museum exhibits. In both cases the selection, bringing together, and placement of objects are important creative processes. We consider this ensemble of disparate objects, in a foreign location, as a deliberately meaningful and challenging cultural act which can serve as analogy for the experience of migration. A transdisciplinary reflection, from the perspectives of interior- and exhibition design, is presented on the assembly of these objects. We will argue that ensembles like these are used to establish, support, and tell specific narratives. The trans-placed objects collected in this ensemble were appropriated from different human eras and language communities to construct a contemporary human identity. In this case, cultural identity is attributed to a specific place (southern Africa), but it could be more apposite to attribute identity to a specific time (21st Century).

We argue that archaeological ensembles could be a meeting point for a dialogue about identity, and that it is possible to construct identities of shared time (rather than of shared place) when the common human aspects of objects are emphasised.

07 USING CULTURAL HERITAGE FOR INTEGRATION: A SPANISH INITIATIVE IS USING CULTURAL HERITAGE AS A TOOL FOR INTEGRATION

Author: PhD candidate Sabrine, Isber - Heritage For Peace; CSIC-IMF; university of Girona (Presenting author)
Co-Author: Dr Gibaja Bao, Juan - CSIC-IMF
Keywords: integration, immigrants, local society, archaeology
Presentation Preference: Oral

During the last 15 years, Spain has received hundreds of thousands of immigrants, The city of Barcelona have become one of the most attractive cities for the immigrants in Spain, important part of these immigrants came from poor countries as Pakistan, Bangladesh, West African countries and from Middle east (especially Syria and Iraq) According to different reports these immigrants still have difficulties to integrate within the local society of the city of Barcelona. In 2014 the Spanish National Center of Research (CSIC- IMF) has started a new initiative called Raval 6000 años de historia (6000 years of history in the Raval) which aim to use cultural heritage as a tool to help the immigrants to integrate in the local society. This project takes place in the neighborhood of Raval (A neighborhood of Barcelona with 50% of immigrant population) which is considered one of the most problematic neighborhoods of the city for issues such as drugs, prostitution, unemployment, etc. The purpose of the project (Raval 6000 años de historia) is to communicate the knowledge of the researchers from CSIS in prehistory in general and the archaeological remains documented in El Raval in particular with the people of this neighborhood. The activities conducted by the researchers, were designed to reach all kinds of local people (Spanish and immigrants), regardless of their origin, age, sex, religion or social status, in order to promote the intercultural dialogue between the immigrants and the Spanish local society. In this paper we will present a summary of the activities we carried out, how we organize these activities, what degree of acceptance they received by the immigrants and local people and how we valued this experience, in addition we will give an overview of our future activities which we plan to do for the next 2 years and how we aim to carry out this pilot project to more places in Spain.

233 PRESENT IDENTITIES FROM THE PAST: PROVIDING A MEANING TO MODERN COMMUNITIES

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author: Vianello, Andrea (United Kingdom) - independent researcher
Co-Author(s): Gheorghiu, Dragos (Romania) - Universitatea Nationala de Arte Bucuresti
Keywords: contemporary identities societies communities environment
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The fundamental relevancy of archaeology has been increasingly questioned in recent years, because the discipline has traditionally been an intellectual investigation into the mysteries of the past, often without a purpose, even one just perceived or imagined. The present time enables us to record and investigate reality in scientific ways impossible just a decade ago, and yet the loss of natural environments and cultural heritage has never been larger. The very concept of culture is threatened by a globalized and homogenizing world that produces uncertainty, fear and dissatisfaction.
This session will bring together papers that focus on past cultures and characterising environments to (re-)discover our roots and cultural individuality, providing a meaning to what we are losing. If we are to halt and reverse this trend towards cultural and environmental destruction, we need to explain why such things matter to us today. Archaeology can provide a long-term perspective of a territory that is detached from specific cultural meanings, bonding people to the land they live in. It can also show cultures and societies in constant flux, adapting and interacting, helping modern societies to find novel identities. And the past offers plenty of lessons on key themes such as technology, environment, etc. Papers able to address the artificial constructs of modern nationalism suggesting novel identities are particularly welcome. Examples of positive lessons or warnings from the past applicable today are sought for. Many local communities need to renegotiate their identities and meanings, archaeology must go beyond commercial exploitation of the heritage.

01 WHY ARCHAEOLOGY SHOULD BE PART OF THE CURRICULUM IN GENERAL EDUCATION

Author: Dr Bouissac, Paul - University of Toronto (Presenting author)
Keywords: curriculum, education, communities
Presentation Preference: Oral

An important dimension of human identities is the temporal depth that is expressed in narratives (personal life story; family genealogy and anecdotes; local and national history). In modern education systems, the latter is made an essential part of the basic curriculum. But the teaching of history tends to be ethnocentric, nationalistic, and divisive because its structure and contents depend on the starting point that is arbitrarily selected as the beginning of the narrative and focuses on antagonistic relations with neighbouring kingdoms and nation states. This does not necessarily invalidate the teaching of history in itself as part of the curriculum but it has the potential of promoting jingoism and exclusion. The teaching of archaeology as a part of the regular curriculum brings temporal and spatial perspectives that are conducive to more balanced and integrative construction of the past. This paper will develop four arguments in favour of the teaching of archaeology from the earliest rock art to the Iron Age as a way to improve the sense of local belonging and mitigate the alienation generated by the globalization of culture. First, archaeology helps to ground the identity narrative in a human past that transcends recent territorial divisions; secondly, it focuses attention on universal human abilities to overcome environmental and social challenges; thirdly, it exposes students to cultural artefacts that bear witness to human innovativeness and creativity; finally, it brings forth the importance of the natural environment through representing what is known of the climatic and geographic conditions that were contemporary to these past activities. Since almost all localities hold some kinds of archaeological record, the teaching of archaeology contributes to the healthy construction of identities that are both locally grounded and integrative rather than divisive.

02 THE SOCIAL IMPLICATION OF ARCHAEOLOGY: BUILDING A NEW IDENTITY FOR A CONTEMPORARY VILLAGE

Author: Professor Gheorghiu, Dragos - National University of Arts (Presenting author)
Keywords: social implication archaeology
Presentation Preference: Oral

Although it is an instrument for the study of the past, archaeology can also build new identities. For the last decades we have witnessed the accelerated loss of identity experienced by traditional societies, to cite only the case of Romania. Here, not only communism, but also globalization contributed to the eradication of traditional rural communities. The present paper describes the social implications of an experimental archaeology project spanning fifteen years that taught local history through the reproduction of local ancient technologies. The first stage of the project was dedicated to teaching the community to reproduce the local prehistoric and historic local ceramic technologies; this led to the emergence of a new local ceramic style, the ethics of this method being discussed during a round table at EAA in Esslingen. A second stage involved the creation of a virtual museum that presented the local technologies in reconstructed (real and virtual) contexts. The reconstructed contexts, presented in Second Life, as well developed for IT mobile phone applications were designed as a means for the young villagers to discover the local archaeological heritage in digital form. This digital strategy enabled an efficient transmission of the experimental archaeology and re-enactments information to the community, allowing to "bond people to the land they live in".

03 TRADITIONS, CAPACITIES AND RESPONSIBILITY OF ARCHAEOLOGY IN CONFRONTING THE KEY CHALLENGES OF THE CONTEMPORARY WORLD

Author: Doctor/Phd Tevdovski, Ljuben - Goce Delcev University
Co-Author: Ms Sokoloska, Angela - Institute of Cultural Heritage and Archaeology (Presenting author)
Keywords: archaeology, nationalism, responsibility
Presentation Preference: Oral

In the contemporary global environment the archaeological science and practice are frequently misconceived to represent purely intellectual quest for the unknown, which sporadically entertains the wider public with mysterious fables and glittering artifacts. Yet, the professional history of this discipline exposes its alter-ego, rooted deeply in the core needs and existential dilemmas of the early modern societies.
The great interest in archaeological heritage in the early modern period and the beginnings of the archaeological practice are inspired by the quest of the Europeans to find their own modus vivendi and identity in the periods of migratory movements, demographic changes and instability of ideologies, institutions and balance of power.
In such societal conditions the antiquarians and the first protagonists of the archaeological profession acted as omnipotent polymaths able to provide key answers, excavating through the layers of "wisdoms from the antiquity". Their research and activities provided and were perceived as fundament for development of institutions, authorities, political system, arts, crafts and scientific knowledge that increased the quality of life, and nexus aiming to overarch cultural, religious and social differences.
Even more, through its professional history, with all its great hypotheses and misconceptions, glorified artifacts and famous "digs", archaeology played an active role in the creation or transformation of Europe's collective, national, regional, communal and personal identities.
Therefore, the contemporary archaeological science that went through a great self-reflective process in the last decades, aware of its former shortcoming, but also of its roots and great potential, has a chance and responsibility to confront some of the challenges of the contemporary world. In this new period of rapid migratory movements, demographic and social change, and global, institutional and ideological instability, archeology has particular capacities and role to widen up the European minds, and support the creation of new ideas, technologies and inclusive identities.

04 THE ARCHAEOLOGY OF GLOBALISATION AND NOTHINGNESS. PROBLEMS AND SOLUTIONS FOR FUTURE NARRATIVES

Author: Dr Vianello, Andrea - independent researcher (Presenting author)
Keywords: globalisation identity society
Presentation Preference: Oral

Lost cultural identities produce a void in societies that is emerging as a powerful political drive. Globalisation has emerged as a topic of relevance in archaeological discourses since the Internet and cheaper airfares connected the world in tangible ways, bringing upon a perception of a connected world. Archaeologists have had interests in trade, exchange and cultural transmission since the pioneering days, and have been quick to present narratives of an interconnected world. Globalisation is not a recent product of technology, it is a dynamic process that has been in the making for long. Archaeologists have also understood that the process is affected at local level, effectively breaking up into many individual localities that both affect the global process and are affected by it. The local level is where the interaction happens. Archaeologists have narratives for the lo-

cal and generalisations to cater for the global processes. They are both relevant, but also parts of the same dynamics, and approaching them separately has proved unsuccessful, with competing views favoured that are often irreconcilable.
Local cultures are an essential component of social identities, and while a single culture/identity appealed to people that wanted to emphasise a social brotherhood of all humans, this view is not for all. Those embracing it are aware of the localities of individual elements, and enjoy experiencing different localities, travelling in the real (cheap air-fares) or virtual (Internet) world. However, most people need binding elements with their community and territory to continue expressing the local culture that others may enjoy casually. This is where things have gone wrong, as many people are left culture-less and in search for an identity in artificial narratives that are perceived as foreign or unknown. The archaeological heritage seen through the prism of globalisation lacks the local dimension, and results in nothingness to many.

05 CONFORMING TO TOURISM: THE TENSION BETWEEN SMALL FARMS AND HERITAGE IN DUMFRIES AND GALLOWAY, SCOTLAND

Author: Dr Anderson, Christine - Berea College (Presenting author)
Keywords: Tourism, Scotland, Archaeology
Presentation Preference: Oral

Dumfries and Galloway, Scotland is a unique space to examine the dynamic and often tensioned exchange between local, small farms and Scotland's tourism industry. Struggling economically, the region has attempted to "improve" itself to become more viable within this industry. However, what happens when regions do not "fit" neatly within the tourist brand "Scotland?" What happens to smaller farms that shift their attentions to tourism because agricultural production is slowing? These are two questions this paper seeks to explore by looking further back in history, a history that locals understand is not fully viable within a national story, but is still important to them. Presented in two parts, this paper wrestles with the region's continued struggle for economic development and finding and maintaining its local identity in the midst of a national story the region does not find itself. The first part of the paper discusses the agricultural improvements of the 18th and 19th centuries and their impact on the region. Archaeological research indicates a subtle, but detrimental erosion of community as tenants lost leases because agricultural improvements did not produce enough income to pay rent. The second part of the paper presents, through ethnographic research, a similar trajectory of improvements in which struggling farmers alter or even abandon their farming in favor of a more tourist based industry. Finally, this paper argues that archaeology can and should be focused not only on the past but also on the future.

06 'FEN SLODGERS' IN A WETLAND WORLD - IDENTITIES AND RESILIENCE IN THE DYNAMIC ENVIRONMENT OF THE EAST ANGLIAN FENS (UK)

Author: Ms. Huisman, Floor - Durham University (Presenting author)
Keywords: Identities, environment, wetlands
Presentation Preference: Oral

People's identities are very closely linked to the environment and landscape they inhabit. When these are threatened, either by human intervention or natural causes like climate change, so are people's identities. This is very clear in the East Anglian Fens (UK). Before their drainage in the 16th century AD, the Fens were Britain's largest wetland; an area rich in wild plant and animal resources. These resources were extensively exploited by local communities, with some people becoming specialised 'wetlanders' (referred to as 'Fen slodgers') with their own unique identity. Their identity was closely bound to the unique environment they inhabited.

Yet the Fens had not always been wet; the Fenland Basin started out dry and only became truly wet in the Bronze Age as a result of a rising sea level. This begs the question of when and how this unique wetland identity arose. This paper aims to consider this question by tracing the effect of major changes in the Fenland landscape and environment on the identities of past communities living here. It will provide a long-term perspective on the resilience and adaptability of these communities, resulting from their intimate relation and interaction with an ever-changing and very dynamic environment. Yet this paper will also consider the negative effect of the destruction of the Fenland environment in the historic period, when demands for fertile arable land grew and distant landowners started draining the wetlands. Despite heavy protests from local wetlanders the wetland landscape disappeared and so did the Fen slodgers and their unique way of life. Thus, this Fenland case study provides insights into the close link between people's identities and their landscape and environment which are relevant in today's rapidly changing world, where many landscapes and communities are affected by the effects of climate and environmental change.

07 A BATTLE FROM THE PAST: THE SUCCESSIVE ARCHAEOLOGICAL NARRATIVES ON ALJUBARROTA

Author: Dr Martins, Ana Cristina - Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa (Presenting author)
Keywords: Archaeology, Portugal, Aljubarrota,
Presentation Preference: Oral

Contrary to what happened in other coeval totalitarian regimes, the Estado Novo ('New State') (1916/33-1974) didn't use archaeology to support its own agenda.
Nevertheless, there was fieldwork leaded mostly by archaeologists engaged in demonstrating the ancestry of the so-called 'Portuguese Man', who obtained financial support from state institutions.
But, there was a site which attracted the attention of politicians: the field where took place the Battle of Aljubarrota, in 14th august 1385.
The archaeological excavations took place by the end of the 60ies and revealed several data which allowed rebuilding the battle strategy and confirming and deconstruct some information reproduced over the centuries.
But, mostly because it was a project highly supported by the 'Estado Novo', the battlefield was somehow forgotten soon after the Revolution of 25th April 1974.
It was only in recent times, that the site was recovered, classified as National Monument, and object of new research. Moreover, it was established a 'Fundação Batalha de Aljubarrota' ('Foundation of the Battle of Aljubarrota'), responsible for activities aiming to protect, study and divulge the history of the battle.
But, how does the Portuguese society deal with this revival? Does it matter? If it matters, why does it matter, how and by whom? Are the activities carried out by the Foundation known by the public? How do local people understand this site? Does the site does contribute to local life? Who are the Maecenas of the Foundation, and what are their purpos-es?
Finally, but not the least, is it really necessary to recover and emphasizes this historical episode in the 21th Portugal?
Answering to these questions, we argue that the specificity of the history of Portugal can partially explain the indifference towards archaeological issues, such as this battle, when compared to other European countries, such as Spain.

08 THE HELLENOCENTRIC VIEW OF CYPRUS AND NEGOTIATING CYPRIOT IDENTITY THROUGH ARCHAEOLOGY

Author: Dr Markou, Alexandra - Independent Researcher (Presenting author)
Keywords: Archaeology, Cyprus, Politics
Presentation Preference: Oral

In the 19th century, antiquarian and archaeological practices on Cyprus took a Hellenocentric approach. Based on ancient texts and preliminary archaeological finds, it was thought that Cyprus was where Mycenaean Greeks had settled after their civilization in the Aegean collapsed in the 12th century BC.

While Hellenocentricism was a movement sweeping across the eastern Mediterranean at the time, for Cyprus, the repercussions of promoting the island's Greek history and the inhabitants as descendants of Mycenaean Greeks had political ramifications. For one, it led to an uprising by the local Cypriot population against British colonial rule. It also divided the island's two main ethnic groups – Greeks and Turks – and subsequently led to a coup d'état in the mid-20th century.

The archaeology of Cyprus, and the strong push towards Hellenocentricism, played an important role in negotiating Cypriot national identity both during and after British colonial rule. This paper will explore, through an analysis of material remains and excavation reports, how the archaeology of Cyprus was used under British Cyprus and post-colonial Cyprus to promote various Hellenocentric narratives about the island's past. Furthermore, it will discuss how these narratives affect Cypriot identity to this day.

09 THE SÂNTANA DE MUREȘ - CHERNIAKOV CULTURE HISTORIOGRAPHY: NATIONALISM ETHNICITIES, MIGRATION, AND A BATTLE OF IDEOLOGIES

Author: Plăcintă, Tiberiu - "Alexandru Ioan Cuza" University of Iași (Presenting author)
Keywords: Sântana de Mureș-Cherniakov
Presentation Preference: Oral

Nationalist ideology has imprinted its mark on the study of the Sântana de Mureș - Cherniakov (SM-C) culture since the first discoveries were made. Because of the chronological aspect (right before the beginning of the „Migration period"), it soon became a battleground for three different nationalist ideologies : German, Russian (in a broader sense, Slavic, as the discoverer of the first site was a Czech-born Ukrainian) and Romanian, all of whom „claimed" the SM-C culture to demonstrate superiority, continuity and/or a „historical right" to rule certain territories. Of course, after the Second World War, German historiography diverged from this view, but in Romania and the Soviet Union the research of the SM-C continued to be influenced by previous ideas for a few decades. As I will try to show, this heavily impacted both research and the sense of identity of the people, and has echoes that survive until the present day. Now, the historiography of the SM-C culure is divided : some vehemently contest the older ideas and generally avoid talks about ethnicity, while others try to keep a balance between the old and the new. Of course, there is a risk of repeating the mistakes of the past and fueling the far-right movements by popularizing the SM-C culture, but perhaps in the modern context („the migrant crisis", for example) teaching people about a space and time where people of many different ethnical, cultural and religious backgrounds lived together (rather) peacefully might be beneficial.

10 FROM STONE AGE TO SPACE AGE WITHIN ONE LIFETIME - CHANGING IDENTITIES WITHIN TRIBAL SOCIETIES IN PAPUA NEW GUINEA

Author: Dr. dosedla, henry - CINDIS austia (Presenting author)
Co-Author: Dr dosedla, henry - CINDIS austria
Keywords: NewGuinea cultural identity
Presentation Preference: Oral

There are nearly no other examples of a society having faced the transition from Neolithic standards towards modern life styles with the omission of any intermediary historical stages during only one generation as in the case of New Guinea where interior highlands tribes experienced cultural change in just a sudden leap. Having started participating field work among local communities of the Western Highlands Province in 1970 when initial
European contact had occured merely one decade ago provided a chance for documenting several steps of gradual cultural changes having happened there until recently in 2016 when the research area was re-visited for the last time with a number of the old tribes members were still able to give vivid personal accounts on their experiences during past few decades.

11 A BIAS HISTORY A BIAS IDENTITY? WORKING WITH ALTERNATIVE INTERPRETATIONS OF HISTORY IN SCHOOL SETTINGS IN THE DOMINICAN REPUBLIC

Author: Herrera-Malatesta, Eduardo - Universiteit Leiden (Presenting author)
Co-Author: Con Aguilar, Eldris - Universiteit Leiden; Álvarez, Arlene - Museo Arqueológico Regional Altos de Chavón; Universiteit Leiden
Keywords: Colonial-representations, Archaeology, Education
Presentation Preference: Oral

This paper explores how contemporary archaeology in the Caribbean needs to critically deal with historical interpretations and representations of indigenous communities from the first chroniclers to XX century archaeological research. Most importantly, we need to begin debating and reflecting on how to work with contemporary communities towards the reinterpretation of historical records that have permeated popular knowledge and influenced narratives of cultural and national identity, by presenting the indigenous past from a bias and colonial perspective. We will focus on the case of Bohío island (called Hispaniola by Columbus, and today's Dominican Republic & Haiti). The European chroniclers reported that the the island was formerly controlled by five cacicazgos (a hierarchical social and political system), and from a later map created by Jesuit French missioner Charlevoix in 1731, the borders of these territories were drawn. In this map, Charlevoix depicts five territories with clear frontiers that were used by 20th century researchers to develop ideas of the cultural composition of the pre-Columbian groups of the island. However, recent archaeological studies are highlighting that the use of Charlevoix's map is uncritical of other evidences, that could lead to alternative representations. Additionally, this map has been widely used in history books and school-textbooks to teach about the pre-Columbian history. In this paper, we will address the issue of re-negotiating identities within the school-context. Since teachers has been using this map of the cacicazgos as one of the references to describe the lifeways of the indigenous groups. Our aim with this presentation is to outline how colonial representations have affected the perceptions both researchers and general public have of past peoples in the island, and the challenge we have as archaeologist and educators to find a common ground to incorporate archaeological findings in classroom settings.

12 CONTEXTUALIZING AFRICAN AMERICAN WORK AND LANDSCAPES IN THE SOUTHERN UNITED STATES

Author: Mr. Botwick, Brad - New South Associates, Inc. (Presenting author)
Keywords: heritage, historical dialogues
Presentation Preference: Oral

From the most intimate details of individual households to the broadest public spaces, the study of material culture can provide new perspectives about how people lived and the work they did. An outcome of research on material goods and landscapes is that modern communities can see the contributions of their ancestors to past social and economic structures. This, in turn, can help enfranchise social groups and communities who have historically been regarded as unimportant within broad cultural or historical developments. Examples from the Southeastern United States illustrate the ways that enslaved African Americans helped create the landscapes of the region not only through their labor but also with the skills, knowledge, and experience of rice cultivation. Their influence on the landscape is still visible today. A second example shows that African Americans sought numerous ways of making their livings, even within slavery. Far from scrounging a hardscrabble existence, they were energetic and skilled operators in building an underground economy. Although much of this is known from historical sources, contextualizing various artifacts found at slave and freed people settlements provides tangible evidence of the breadth of their economic activities. Focusing on topics such as these reveals that African American contributions to Southern culture were substantial and enduring, and went far beyond coerced manual labor. These contributions entitle African Americans to participate in discussions of U.S. history as equal partners in building and shaping it.

237 ARCHAEOLOGICAL PRACTICES AND KNOWLEDGE WORK IN THE DIGITAL ENVIRONMENT

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Huvila, Isto (Sweden) - Uppsala University
Co-Author(s): Dallas, Costis (Canada) - University of TorontoLaužikas, Rimvydas (Lithuania) - University of Vilnius
Keywords: practices, knowledge, use, research, digital
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The last ten years saw significant growth in the use of digital methods and tools in archaeological work. However, a systematic, comprehensive account of how digital information, tools and infrastructures are actually used by archaeologists and other users and producers of archaeological information is missing. Both archaeologists, and researchers in other 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 fragmented, at times anecdotal, and failing to address the complexity and range of contemporary archaeological practices in the digital environment. This is striking, as better understanding of archaeological practices and knowledge work has been identified already for a decade ago as a major precondition in order to realise the potential of infrastructural and tools-related development in archaeology.

The session brings together researchers and research projects studying archaeological practices, knowledge production and use, social impact and industrial potential of archaeological knowledge. It aims to present and highlight the ongoing work on the topic around Europe, spanning diverse contexts from archaeological fieldwork and collections-based research and stewardship of archaeological data to scholarship, and archaeological practices involving local knowledge and global communities. The speakers include participants of the COST Action "Archaeological practices and knowledge work in the digital environment" (http://www.cost.eu/COST_Actions/ca/CA15201). Beyond the current work in this network, this session invites contributions from all researchers conducting theoretical and empirical research on archaeological work, knowledge production and use in archaeology and other relevant disciplines.

01 REPORTS ARE EASY, DATA IS DIFFICULT

Author: Prof. Huvila, Isto - Uppsala University (Presenting author)
Keywords: reports, data, work
Presentation Preference: Oral

Even if it is generally acknowledged that archaeological primary data is important to preserve and holds a major potential for future research and use for diverse purposes and field reports are often blamed of missing important details, the latter are conspicuously resilient as the principal informational outcomes of archaeological fieldwork. Based on an empirical interview and observation studies of Swedish archaeologists and archaeological information managers, the presetation discusses why reports are favoured in archaeological knowledge work and what makes the management and use of primary research data surprisingly difficult. Besides shedding light to the specific issue of the choice of information artefacts, a closer scrutiny of the paradox of reports and data helps to understand better the fundamental premises and perimeters of archaeological knowledge work and work practices both in field and beyond.

02 CONCEPTUAL MAPPING OF HETEROGENEOUS DATASETS: CIDOC-CRM AND THE COMPLEXITY OF ARCHAEO-HISTORICAL CONCEPTS

Author: Mr. Palsson, Gisli - Umea University (Presenting author)
Keywords: CIDOC-CRM, Iceland, archaeoinformatics
Presentation Preference: Oral

The integration of legacy datasets has become a major issue in archaeoinformatics, evidenced, for instance, by recent Europe-wide projects such as Ariadne and Parthenos. Part of the integration process is the ontological mapping of datasets using tools such as CIDOC-CRM to provide semantic legibility between datasets. While this is relatively straightforward when linking definitions of artefact types across national systems, how effective is CIDOC-CRM when dealing with complex social phenomena? This presentation offers a case study from Iceland, where complex concepts such as ecclesiastical power, farmstead and social obligation are conceptualized and linked to archaeological and historical datasets using CIDOC-CRM.

03 ON THE BORDERS OF ARCHAEOLOGY KNOWLEDGE

Author: Laužikas, Rimvydas - Vilnius University Faculty of Communication (Presenting author)
Keywords: archaeology, knowledge, communities
Presentation Preference: Oral

The word "archaeology" could be mentioned in the lot of different contemporary contexts: "community", "museum", "Egyptian" and etc. The main question there is: why people interests in the archaeological heritage objects, artefacts, information or knowledge? This question could be investigated on the basis of theoretical considerations on Yuri Lotman semiosphere theory and knowledge management cycle models. Yuri Lotman semiosphere theory help to describes the connections between relative centre and the peripheries (as sign structures) of scholar archaeology. The centre may be defined by ["canonical"] scientific paradigms prevailing within a given time moment in scholar archaeology. Periphery, in this case is the creolization space in which (usually through interactions with other culturally more distant sign structures) appear various archaeology-interested communities. Knowledge management cycle models there help us to describe the interests of "outside archaeology" communities to archaeology via concept of "knowledge needs" and to investigate the process of using / re-using of archaeological knowledge via another stages / concepts of cycle model. On these considerations we can pattern and research the set of creolised areas of reality, where archaeological data, information, knowledge and heritage are used and reused in creation of new objects of reality (in meanings of CIDOC-CRM as "Thing"). This modelling pattern will presented at conference paper.

04 FOSTERING SYNTHESIS IN ARCHAEOLOGY

Author: Dr Altschul, Jeff - Statistical Research, Inc./SRI Foundation (Presenting author)
Co-Author: Dr Kintigh, Keith - Arizona State University
Keywords: Synthesis, grand challenges
Presentation Preference: Oral

Archaeologists now have access to more data than ever before thanks in large part to laws and regulations mandating archaeological investigations as part of land and resource development. While the data collected by these efforts have allowed us to infer much about the past, they have not led to deeper understandings about the ways in which humans behave that are needed to address society's compelling problems. Achieving that goal requires archaeologists to do more than analyze and interpret project data; they also must synthesize the resulting information into knowledge of complex human behavior that can be objectively evaluated and shared with the public. While this type of research is not entirely new, it goes well beyond the capabilities of any single archaeologist or team of archaeologists because it transcends traditional archaeological skills and reaches into the fields of computer science, statistical analysis, geographic information systems (GIS), visualization, mathematical modeling, and environmental science. Yet, if we could access the incredible dataset of publically funded archaeology and garner the requisite expertise, there is no telling what we could learn about the myriad problems that confront us. How can humans successfully adapt to long-term environmental change? What social structures best relieve structural inequality in market economies? How can migrants be integrated into complex societies? These, and other grand challenges can now be answered. Borrowing from models in the ecological sciences, we propose the creation of the Coalition of Archaeological Synthesis. In this paper, we describe our concept of a coalition and how we intend to bring it to life.

05 DIGITAL ARCHAEOLOGY AND THE RHETORIC OF DEMOCRACY

Author: Dr. Hacigüzeller, Piraye - Ghent University (Presenting author)
Keywords: digital archaeology, democracy
Presentation Preference: Oral

The term democracy is arguably tainted today by assertions of it being "in danger of becoming something of a sham" (Thrift 2008: 3) or used to assure populations that it is "the condition to which all progressive-minded societies should aspire" (Wolin 2000: 20 cited in Thrift 2008: 3). The rhetoric of democracy is said to douse (Wolin 2000: 20 cited in Thrift 2008: 3) and disarm citizens in the sense that it is only possible thanks to the "waiting power" of people, i.e. people's ability to wait and let others wait in order to govern and act on problems (Sloterdijk 2005: 944).

This is an important debate for archaeology given that digital archaeological practices are often presented to be democratic and emancipatory in the sense of allowing multiple voices to be heard and provide easy access to information. The principal aim of the presentation will be to identify the effects of the public rhetoric of democracy on the perception of digital archaeology with which it is often associated. Is digital archaeology as equalizing, participatory and commonalizing (see Wolin 2000: 20 cited in Thrift 2008: 3) as it is purported to be? Regarding the "waiting power" public democracy rhetoric may imbue archaeologists with, may digital archaeology be methodologically disarming archaeologists by rendering non-digital methods less acceptable, and keeping archaeologists on hold until they feel able to effectively participate in the archaeological process and access archaeological information uninhibitedly through digital media.

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06 ARCHAEOLOGICAL INTERACTIONS BETWEEN OBJECTS, AMATEURS AND PROFESSIONALS ON FACEBOOK: A META-ANALYSIS AND CONCEPTUAL FRAMEWORK

Author: Prof. Dallas, Costis - Faculty of Information, University of Toronto; Digital Curation Unit, IMIS - Athena Research Centre (Presenting author)
Co-Author: Ms Kelpšienė, Ingrida - Faculty of Communication, Vilnius University
Keywords: social_network_sites, Facebook, public_archaeology
Presentation Preference: Oral

Social network platforms such as Facebook emerged recently as a major environment where members of amateur, local and source communities engage with each other, with professional and academic archaeologists, and with objects related to archaeology. While social network sites engaging with archaeology on Facebook are increasingly common, they differ significantly with regard to their users, their motivations and objectives, and in how they constitute collective practices of memory and material engagement,

give rise to communities of interest and practice, enact professional and cultural identities, and shape the production of archaeological knowledge as well as the interpretation, appropriation and governance of archaeological heritage.
We take stock of our respective research on archaeological communities on Facebook from Northern and Southern Europe, as well as a meta-analysis of recent studies on archaeological Facebook groups and pages, to establish a framework for evidence-based examination and analysis. Examining Facebook sites involving professional archaeological networking, amateur archaeology, as well as promotion, public communication and interpretation of archaeological heritage, we identify diverse kinds of amateur and professional actors, information objects and communication genres connecting them with aspects of archaeological heritage, and interaction patterns connecting them in structures of identity and memory. We assess theoretical concepts relevant to the analysis of archaeological Facebook sites, such as the dramaturgical theory of the self, the afilliative power of objects, communities of practice, social capital, tacit knowledge, participatory heritage, and institutional isomorphism. On this basis, we examine critically how they may become sites for civic participation, creativity and empowerment. We investigate the agency of objects related to archaeology in triggering affect, cognition and interaction between diverse archaeological actors. And, finally, we elaborate a conceptual framework suitable for capturing, representation and analysis of archaeological Facebook pages and groups across Europe.

07 SHORING FRAGMENTS AGAINST OUR RUINS: EXCAVATION AND INTERDISCIPLINARY RESEARCH DURING THE EXTENSION OF THE METROPOLITAN RAILWAY TO PIRAEUS, GREECE

Author: Mr Peppas, Georgios - Ephorate Of Antiquities of West Attika Piraeus and the Islands/Greek Ministry Of Culture and Sports (Presenting author)
Keywords: Piraeus, interdisciplinary, digital
Presentation Preference: Oral

"These fragments I have shored against my ruins" T.S.Eliot in the final lines of his Waste Land describes his attempt to collect and pile together in a sort of testimony broken pieces from a glorious, high-cultured past that are scattered across a deserted "land". Could we borrow Eliot's allegory to depict archaeological research in contemporary Piraeus? It is evident today that historical landscapes act as memory banks, both storing and losing features through time. In occasions such as the construction project of the Metropolitan Railway to Piraeus, fieldwork and documentation are conducted in the center of a modern city where collecting fragmented data and at the same time unveiling and reviewing fragments of evidence scattered across archives and bibliographic references is a complex task.
As this paper will show, a variety of digital tools were applied for features of particular research or presentation value to be sorted and analyzed, on a quick turn-around, in order to provide immediate feedback to the excavators, answer specific questions and share information. Thus, a collective interdisciplinary approach was not just an option, but a primary scope: our team invited architects, civil engineers, hydrologists, geologists, urbanists, historians, paleoanthropologists and digital experts not just to assist and provide advice but to work and talk in the field, draw and take measures together, articulate dialogues, stoke debates, generate hypotheses and borrow from each other's toolbox.
Modern studies are introducing the term adoption. Whichever the term, we discovered that as certainties about the boundaries of different disciplines were lost over time, some of the pieces we collected together started to join.

08 TERRA MOSANA: A CROSSBORDER IDENTITY NEWLY EXPLAINED.

Author: Drs Wetzels, Eric - Municipality of Maastricht (Presenting author)
Keywords: crossborder, digital narratives
Presentation Preference: Oral

Project Terra Mosana is a collaboration between municipalities, heritage sites, museums, universities and citizens within the Euregio Meuse-Rhine (EMR), in order to reinforce this Euregio, by explaining its shared identity. TM will do this through digital exploitation of its cultural heritage and by constructing new storylines about this shared history. The project exists of an newly developed method, and of new products, such as experiences in 3D-modelling, 3D-reconstructions, in augmented and virtual reality.
This project is meant to be evolving and sustainable. The system will be open and welcomes new partners. The project also needs the development of a technical platform, and a legal and ethical framework.
In the long term, the involved network aims to develop and to establish an integrated digital platform for all existing cultural heritage.
For the construction of new storylines, the Historical 3D Matrix-model is developed; this model uses as little information as possible, instead of the usual way in which as much information as possible is mounted. Instead it is focused on explaining relationships and interdependence. Important are the specific and disctinctive features of each cities' history in the Euregio, which show and explain the historical connections between the cities within the Euregio. For instance: in this model the role of Roman Maastricht is reduced to the functioning as a harbor-city for Tongeren and Heerlen/Aachen. Also the presence of a Roman bridge is distinctive. Aachen is known for its sulfur watersources, Heerlen has pottery-kilns, Liege was just a large Villa Rustica on the boards of the river and Tongeren was the centre of administration. This model and the focus on distinctiveness makes it possible (and forces archaeologists!) to think about and to reconstruct a different view on history and makes it possible to tell new storylines/ new narratives.

09 BIG DATA IN ARCHAEOLOGY: ARCHAEOLOGICAL SESHAT AND BEYOND

Author: Filipowicz, Patrycja - Adam Mickiewicz University (Presenting author)
Co-Author: Krueger, Marta - Adam Mickiewicz University; Prof. Marciniak, Arkadiusz - Adam Mickiewicz University
Keywords: Big Data, database
Presentation Preference: Oral

The paper aims to discuss the relevance and potential of Big Data in archaeology. In particular, it will present the foundations and character of Archaeological Seshat, an innovative tool for collecting, storing and manipulating a large body of archaeological data. It was created within the framework of Seshat Global History Databank, which is an international initiative of social science scholars to build an open repository of expert-curated historical time-series data. Its main goal is to record geo-temporal datasets describing how hundreds of variables describing social complexity changed with time and space. Seshat is one of the use case of the international ALIGNED project, funded by Horizon 2020. ALIGNED develops models and tools to convert Big Data sources into structured knowledge, using the Linked Data approach. The paper will present preliminary results of applying Archaeological Seshat for explaining different trajectories of development of prehistoric communities in the period stretching from the Early Neolithic until Late Chalcolithic in the area from the Near East to Central Europe. It will further demonstrate a potential of Archaeological Seshat for testing various hypotheses related to the developments of human groups in SW Asia and Europe.

10 DIGITAL DOCUMENTATION PRACTICES ON GRAVE EXCAVATIONS – DIFFERENT METHODS AND THEIR USE

Author: Lehto, Heli - Muuritutkimus Ky; University of Helsinki (Presenting author)
Co-Author: Helamaa, Maija - Muuritutkimus Ky; Uotila, Kari - Muuritutkimus Ky; University of Helsinki
Keywords: Practices, digital
Presentation Preference: Oral

During the field seasons of 2015 and 2016, Muuritutkimus excavated three 18th-19th century cemeteries in Southwest Finland. Different digital and non-digital documentation methods were used according to the preservation of the graves and the conditions at the sites.

Total station was the main tool used for overall mapping, but for documenting the graves, different methods were used. In 2016, a course which concentrated on laser scanning, was held at the University of Helsinki by Muuritutkimus. After it, a Riegl VZ-1000 laser scanner was adopted as a documentation method for the graves at one site. At the same time, another cemetery was being documented by drawing by hand. Photogrammetry will be used as a documentation method in 2017, as field work continues on one of the sites.

This paper concentrates on the experience of using laser scanning as a documentation method for graves, both during field work and afterwards when processing the data. It will also be compared with the process of making the handmade drawings into digital CAD-data.

At the moment in Finland, the main aim of developing digital documentation, is to make the field work more effective and as accurate as possible, not to produce material for researchers. This is the case because the collected digital data is rarely used for further archaeological research. In order to make the digital material more useful, new ways of research need to be developed as well. This would also enable further improving of the digital methods.

11 A BRIDGE BETWEEN LANDSCAPES AND METHODOLOGICAL APPROACHES. THE ROMAN BRIDGE OF COLONIA IULIA TURRIS LIBISONIS, PORTO TORRES, SARDINIA, ITALY.

Author: Research fellow petruzzi, enrico - Università di Sassari (Presenting author)
Keywords: urban archeology
Presentation Preference: Oral

The Roman bridge of Porto Torres is a monumental symbol of the potential of the contradictions of contemporary archeology in now day Sardinia.
The bridge keeps together the two shores of the main local river, very close from a geographical point of view, but still far from a landscape point of view as defined by the European Landscape Convention, namely as part of the territory as well as perceived by the people who inhabit it.
On the west bank, the industrial sector almost completely into disuse and symbol of the failure of the industrial project, cause of the economic and social decay of the local community. On the east bank, the archaeological park, a wide area still largely to be investigated, epicenter of the ancient city, escaped from industrialization and speculation, where still remain monumental evidences.
The paper intends to explore, taking the Roman bridge as a node of the network of disciplines and interests involved, the multiplicity of investigations and projects developed in recent years in the historical city of Porto Torres.
The analisys of data acquired in several investigations in the urban area represent the basis for an effective recomposition of the history of the city and the territory.
The relationship with the land resources, the inclusion in the Mediterranean commercial network, the expansion and contraction processes, the infrastructure such as the bridge and the colony's ports are some of the most studied aspects, fundamental elements not only from a purely historical and archaeological point of view but necessary basis of knowledge for planning any kind of urban transformation.
Main goal is the construction of a bridge between the different branches of research, a tool for overcoming the disciplinary boundaries with the aim to acquire archeology between the real interests of the citizenship.

12 E-RIHS: DEVELOPING AN INTEGRATED RESEARCH INFRASTRUCTURE FOR HERITAGE AND ARCHAEOLOGICAL SCIENCE

Author: Ms Teehan, Mary - The Discovery Programme (Presenting author)
Co-Author: Mr Corns, Anthony - The Discovery Programme; Dr Monaghan, Evie - The Discovery Programme
Keywords: Digital, Infrastructure, Science
Presentation Preference: Oral

The European Research Infrastructure for Heritage Science (E-RIHS) is developing a research infrastructure for the support of heritage interpretation, preservation, documentation and management. Once established, it will consist of a centralised E-RIHS coordination office, National Hubs and distributed facilities comprised of fixed, mobile, archival and digital labs of excellence. It will provide trans-national access to state-of-the-art technologies, scientific archives and the methods associated with them. Ultimately, it will support cross-disciplinary research communities and advance the understanding, and preservation of, global heritage. Is this a solution to synthesising the fragmented nature of multiple research projects?
EU collaborative projects and networks such as CARARE, DARIAH, ARIADNE, Europeana and IPERION CH have been addressing archaeological research in scientific and digital environments, including the development of high quality knowledge tools. Common to all of these was a finite life-cycle. Maintenance of access, updating research, ensuring methodology compatibility and building awareness of the knowledge create common challenges. Therefore, the resource and economic investment in research has often not reached its optimum value.
Longevity of research outputs and prolonging knowledge work is crucial for cultural heritage disciplines. Such disciplines have benefited from recurring European funding since 1999 through various funding frameworks, most recently Horizon 2020. In recognition, E-RIHS was included in the ESFRI Roadmap in 2016 and is currently preparing towards fully sustainable infrastructural operation by 2022. It is important to map out where gaps and innovations lie and what lessons can be learned from past projects to enable E-RIHS to build a model of excellence and be applicable on a global scale. Creating, synthesising and streamlining knowledge tools for heritage science researchers and potential end users will be the measure of its success. This paper will outline progress made and highlight obstacles to heritage science collaboration faced by E-RIHS, through an Irish case study.

13 COMPUTERS AREN'T MAGIC - WHY AN INTENSIFIED DIALOGUE BETWEEN ARCHAEOLOGISTS AND COMPUTER SCIENTISTS IS NECESSARY

Author: Mr. Schubert, Lutz - University of Ulm (Presenting author)
Co-Author: Mrs. Hunt, Gill - Hunt Lancaster; Prof Jeffery, Keith - Keith G Jeffery Consultants
Keywords: computer models, analysis
Presentation Preference: Oral

Archaeology has to deal with a large amount of data from different domains, integration of which leads to new insights and scientific knowledge. The size, scope and diversity of such data seems to beg for computational power and new data mining technologies. Modern IT even offers much more: agent-based models, climatic simulations, deep learning and more.
The actual capabilities of computer simulations are however frequently ignored. It is in general difficult to understand what the computational analysis actually does and when, where and how this is applicable. In fact, many of the computational models were never developed for archaeological use in the first instance. Their application in archaeology sometimes is a bit of a stretch: few statistical methods take into consideration that absence of evidence is not the same as evidence of absence; network analysis builds relationships on basis of selected parameters without considering any logical constraints, as does deep learning; multi-agent systems overly simplify the human behavior to the point where even "swarm intelligence" is not applicable anymore etc.
The actual question boils down to what can be modelled and what can computers actually do with such models.
This paper will present the work and first finds of a special interest group formed between computer scientists and archaeologists to reinvestigate the capabilities and applicability of existing tools and methods. It will discuss some of the general problems in modelling and simulation that one should be aware of when interpreting the results, as well as where current methodologies simply fail to address the needs and context of archaeology. The according special interest group "Digital Archaeology Standards and Practices" is building up a database of methods, tools, sources etc. for analysis and to identify strengths and weaknesses, but also to foster the development of new approaches and reinvestigation of existing ones.

240 PASTORALISTS AS CATALYSTS OF CHANGE: ARCHAEOLOGICAL SCIENCE REVOLUTIONIZES STUDIES OF THE ANCIENT STEPPE

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Haruda, Ashleigh (United Kingdom) - University of Exeter
Co-Author(s): Ventresca Miller, Alicia R. (Germany) - Christian-Albrechts-Universitat zu Kiel
Keywords: Central Asia, Steppe, Pastoralism, Network
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The Eurasian steppe is often conceived of as the confluence between east and west, yet peoples inhabiting this zone have been characterized as mere vectors transmitting goods and technologies. The lack of agency afforded these populations is a relic of past paradigms and recent advances in archaeological science have begun to shed light on the complex and diverse connectivity of people, livestock, materials, and technology across this immense landscape. Emerging evidence suggests that ancient networks in Eurasia were more intricate than previously thought, with patterns of long distance exchange overlaying localized subsistence strategies and mobility patterns. Modeling connectivity across the diverse environmental landscapes of the steppe should take into account variation in subsistence economies, resource exploitation strategies, and the emergence of complex social interactions. The application of new technologies and methods will continue to lead not only to new interpretations of the archaeological record, but also to the construction of new narratives for the steppe zone. This session looks to integrate archaeological science and new models of interaction to reinterpret pastoral lifeways and exchange in ancient Eurasia. We welcome papers that utilize scientific analytical techniques, including but not limited to stable isotope analyses, geometric morphometric methods, pXRF and geophysical prospection to present novel results which reframe our understanding of pastoral lifeways on the steppe.

01 ASSESSING POPULATION CONNECTIVITY AND NON-PRESTIGE EXCHANGE NETWORKS IN PREHISTORIC CENTRAL ASIA WITH GEOMETRIC MORPHOMETRIC METHODS

Author: Dr. Haruda, Ashleigh - University of Exeter (Presenting author)
Keywords: GMM, pastoralism, zooarchaeology
Presentation Preference: Oral

Models of connectivity and exchange across the prehistoric Central Asian steppe have largely been founded upon the distribution of elite funerary goods and limited human genetic studies. While these models emphasise long distance contact and trade, the localised exchange of more prosaic goods, such as livestock, is largely undefined. These non-prestige exchange networks are key to understanding resource availability and redistribution, pastoral resilience, and inter-settlement social links. Tracing the extent of this trade is possible through a number of scientific methods which have recently begun to be widely applied to archaeological contexts, such as pXRF and stable isotope analysis.

Geometric morphometric methods (GMM) have been used extensively in modern zoological contexts to examine animal population homogeneity and admixture but have seen limited use on zooarchaeological assemblages. In this novel study, these methods were applied to ovicaprid remains from three Final Bronze Age settlement sites in central and eastern Kazakhstan. GMM was used to evaluate inter-settlement flock morphological homogeneity and proved useful not just for describing osteological morphology, but also was effective for evaluating flock connectivity. Thus, GMM should be considered as another valuable tool alongside other scientific methods for tracing livestock mobility and exchange. By recasting animals as items of trade, subject to movement along exchange networks, localised exchange patterns can be addressed directly and evaluated separately from global trade of prestige elite goods.

02 GENETIC DIVERSITY OF ANCIENT GOATS AND THE TRANSLOCATION VECTORS OF PASTORALISM TO THE EURASIAN STEPPE

Author: Hermes, Taylor - Kiel University (Presenting author)
Co-Author: Makarewicz, Cheryl - Kiel University; Boehme, Lisa - Kiel University; Frachetti, Michael - Washington University in St. Louis; Voyakin, Dimitry - Archaeological Expertise, LLC; Erlomaeva, Antonina - Institute of Archaeology, Kazakhstan National Academy of Science; Nebel, Almut - Kiel University
Keywords: aDNA, goats, Kazakhstan
Presentation Preference: Oral

Domesticated goat lineages rapidly spread far beyond their centers of origin in the Near East about 11,000 years ago. Due to a unique combination of economic productivity and physiological resilience, goats serve as mainstay species in pastoralist herds and are often used as fallback animals in times of hardship. The translocation of pastoralist lifeways likely involved goats at the heart of a complex set of social processes that unfolded at highly variable geographic and temporal scales. In this paper, we present the first genetic analysis of ancient goats from the Eurasian steppe. We analyzed goat remains from Bronze Age sites in the steppe zone of Kazakhstan to elucidate 1) the regional vectors from which pastoralism came to the region, 2) whether these lineages obtained from afar were back bred with sympatric wild goats, and 3) if the ancient sequences contain traces of genetic improvements for steppe environments and management practices. This research helps fill the gap in our knowledge about the emergence and fluorescence of pastoralism across the steppe zone.

03 MODELING PASTURE - MICROCLIMATES AND SEASONAL MOBILITY

Author: Mr. Caspari, Gino - Sydney University (Presenting author)
Co-Author: Prof. Dr. Betts, Alison - Sydney University; Dr. Jia, Peter - Sydney University
Keywords: pasture, microclimate, seasonality
Presentation Preference: Oral

Given that archaeological fieldwork in Dzungaria has focused most strongly on cemeteries, there is only limited data on Bronze Age settlements and very little is known about patterns of seasonal movement. We correlate an ethnographic study with data from local informants with a NDVI-based model on vegetation cycles to analyze why and how local herders select their range lands, and whether these patterns are applicable to Bronze Age land use in the same region. Micro-climates play an important role in the choice of optimal locations for any given season and despite small climatic fluctuations the data strongly suggest that the seasonality of the Bronze Age sites in the region can be correlated with modern land use. Thus pasture analysis applied to the location of prehistoric sites in Dzungaria can provide significant insights on seasonal use.

04 ENVIRONMENTAL AND LANDSCAPE IMPACT OF NOMADIC PASTORALISM IN THE FOREST-STEPPE OF NORTHERN MONGOLIA

Author: Ostericher, Ian - University of Cambridge (Presenting author)
Keywords: Pastoralism, Environment, Soil
Presentation Preference: Oral

Traditionally, nomadic pastoralist populations are seen as living in harmony with natural environmental factors, moving seasonally according to water and resource availability. However, very little work has interrogated this assumption in past nomadic groups, due in large part to the supposed ephemerality of anthropogenic impact of nomadic pastoralists. Using a combination of pollen, soil micromorphology of buried and existing soils and archaeology, this paper assesses human influence on vegetation and landscape in the sensitive forest-steppe ecotone of northern Mongolia. The Tarvagatai River valley, located around 30km south of the Russian border, contains a high density of Bronze Age khirigsuur stone monuments, and is an ideal area to study pastoralist-environment interactions.

05 LAND USE AND THE DEVELOPMENT OF A CULTURAL LANDSCAPE IN CENTRAL MONGOLIA

Author: Prof. Piezonka, Henny - Christian-Albrechts-Universität zu Kiel
Co-Author: Ahrens, Birte - Christian-Albrechts-Universität zu Kiel (Presenting author)
Keywords: Mongolia/land use/landscape archaeology
Presentation Preference: Oral

The archaeology of the steppe, especially in Mongolia, is mostly associated with burial sites, because settlements are rarely found due to the mobile life of pastoral nomads. The Orkhon valley was the center of steppe empires of such nomadic peoples. City foundations of Uighurs or Mongols affect the type of land use in their surrounding areas and create archaeological sites, which seem to be rather unusual in the typical steppe landscape of Mongolia. Intensive ground interventions for utilization and further processing of natural raw materials are related to the needs of the cities of the mentioned steppe empires.
In contrast to this also numerous prehistoric burial and memorial sites were documented. Petroglyphs and Buddhist inscriptions complete the concept of a ritual or monumental landscape such as known from other regions of Mongolia. During the fieldwork a number of monument types were identified, which has been rarely, if at all, noticed in the scientific discussion up until now. Among them is a monument type, which might be related to military activities.
On the basis of scientific data and GIS-based spatial analyses a reconstruction of the cultural landscape considering the above-mentioned sites and monument types through the various epochs is carried out.

06 WHO POPULATED THE SETTLEMENTS OF THE SCYTHIAN EPOCH IN THE EURASIAN STEPPE?

Author: Dr. Ochir-Goryaeva, Maria - Chalikov Institute of Archaeology; Kalmyk Research Centre Russian Academy of Sciences (Presenting author)
Keywords: Settlements, Scythians,kurgans
Presentation Preference: Oral

The paper is a survey of archeological sites of ancient dwellings such as settlements and camps (with their cultural layers preserved) dating back, alongside the kurgans (mounds), to the Scythian epoch, as well as located in their proximity in the steppe belt of Eurasia. Besides, the survey takes into account graveyards of the region under discussion. Notably, the number of registered and examined ancient dwellings and graveyards has now formed a sufficiently representative database that allows for identifying general

patterns in their spread as compared with the kurgans of the Scythians, the Saka, the Pazyryk of Gorny Altai, as well as the ancient populations of the Lower Volga, the Southern Urals and the Sayan steppe valleys in the Scythian epoch.

07 POTTERY PRODUCTION AND CULTURAL PROCESSES IN THE TRANS-URALIAN STEPPE: THE CASE STUDY

Author: Dr. Panteleeva, Sofya - Institute of History and Archaeology, Ural Branch of RAS (Presenting author)
Keywords: Bronze Age, pottery
Presentation Preference: Oral

The Bronze Age of Eurasia was marked by great technological, economic and cultural innovations. The Trans-Uralian steppe population played an active role in these important prehistoric processes. Numerous sites belonged to several cultural traditions were discovered in the region. As a result of excavations a stratigraphical sequence of these traditions was revealed, but radiocarbon dates demonstrate the intervals of their considerable overlapping in the first centuries of the second millennium BC. Problems of genesis and interactions of local communities are intensively discussed by scholars. Investigation of archaeological ceramics is one of directions in study of such complex cultural situation. The paper aims to present the results of analysis of pottery collection of the Petrovka type from the multilayer settlement Kamennyi Ambar. Morphological and ornamental characteristics as well as archaeological context of vessels will be considered. The work will be focused on recognition of core attributes of the Petrovka pottery and extraneous features. Such observations will enable us to better understand cultural processes that took place in the Trans-Uralian steppe in the Bronze Age. This work has been undertaken within RSF-project 16-18-10332.

08 RECONSTRUCTING BRONZE AGE PASTORALIST LIFE IN THE NORTH CAUCASIAN PIEDMONT ZONE USING MULTI-ISOTOPE ANALYSIS

Author: Dr. Gerling, Claudia - University of Basel, Switzerland (Presenting author)
Co-Author: Dr. Knipper, Corina - Curt-Engelhorn-Centre Archaeometry gGmbH, Mannheim, Germany; PD Dr. Reinhold, Sabine - German Archaeological Institute, Eurasia Department, Berlin, Germany; Dipl. Biol. Berezina, Natalia - Research Institute and Museum of Anthropology Lomonosov Moscow State University, Russia; Prof. Dr. Buzhilova, Alexandra - Research Institute and Museum of Anthropology Lomonosov Moscow State University, Russia; Dr. Nagler, Anatoli - German Archaeological Institute, Eurasia Department, Berlin, Germany; Prof. Dr. W Alt, Kurt - University of Basel, Switzerland; Danube Private University, Krems, Austria; Dr. Pichler, Sandra - University of Basel, Switzerland; Dr. Belinskij, Andrej - Ltd. Nasledie Stavropol, Russia; Prof. Dr. Hansen, Svend - German Archaeological Institute, Eurasia Department, Berlin, Germany
Keywords: Pre-Caucasus, isotope analysis
Presentation Preference: Oral

Caucasia has always been a bridge linking the civilizations of the Near East and Eurasia, and is therefore a key study area for archaeological research. In the BIOARCCAUCASUS project, an international and multi-disciplinary team of scholars from Russia, Germany, and Switzerland studies Bronze Age populations in the Northern Caucasus regarding diet, lifestyle, economic strategies, and mobility. We combine archaeological and osteological methods with multi-isotope analysis (strontium, oxygen, carbon, and nitrogen) in investigating burial communities in the North Caucasus steppe, the piedmont zone, and the Caucasus Mountains. The samples represent different chronological phases ranging from the early Bronze Age Maikop, the middle Bronze Age Yamnaya, Catacomb, and North Caucasian Cultures to the late Bronze and early Iron Age. Extensive comparative sampling of archaeological and modern fauna and vegetation supports the interpretation of the human isotope data. Based on a case study from the piedmont zone, our presentation will focus on both continuity and change of subsistence strategies and mobility ranges of pastoral communities over time.

09 MODELS OF STEPPE TECHNOLOGICAL AND MIGRATION MOBILITY OF THE LATE BRONZE AGE IN THE SOUTHERN URALS

Author: Dr. Shuteleva, Iia - Laboratory of Methodology and Methods of Humanitarian Research, Institute of historical and legal education Bashkir State Pedagogical University named after M.AkmullaDr. Shcherbakov, Nikolai - Laboratory of Methodology and Methods of Humanitarian Research, Institute of historical and legal education Bashkir State Pedagogical University named after M.Akmulla (Presenting author)
Co-Author: Dr. Leonova, Tatiana - Laboratory of Methodology and Methods of Humanitarian Research, Institute of historical and legal education Bashkir State Pedagogical University named after M.Akmulla
Keywords: Ural, steppe, bronze
Presentation Preference: Oral

The Late Bronze Age of the Southern Urals is determined by the period of 1930 - 1740 BC (Beta Analytic). This is connected with the definition of the sources of materials for production in the region, and the problem of the remoteness of the sources for productive activities of the late Bronze Age societies. Geographic location of the studied area - between the European part of Eurasia and Central Asia - makes it possible to trace the movement dynamics of people and technologies. The object of the study was Kazburun archaeological microdistrict in the Southern Urals. Preliminary isotopic analyzes of the metal from the settlements of Kazburun archaeological microdistrict allowed to suggest the presence of lead isotopes uncharacteristic for Kargaly deposit (Southern Urals). Copper, probably, was imported from other regions as "raw" bars or other items. The analyzed samples show chemically stable links with copper-ore sources of Tien Shan Mountains. Tin bronze exists on the territory of archaeological micro-district as finished items. Nowadays there are no evidences to prove these items were produced on the territory of Kazburun micro-district (Shuteleva, Shcherbakov, Radivojević, Pernicka, 2014, p.684). The use of petrographic analysis for ceramics allowed not only to distinguish technological groups of dishes, but also to reveal ancient clay or other sources of raw materials. The results of analyzes of ceramics and clays showed raw materials sources of Transural for Kazburun archaeological microdistrict. The points of production were located remotely from the residential areas of the Late Bronze Age population. Small population groups in each settlement, within the framework of one chronological group in Kazburun archaeological microdistrict, formed their own technological methods and used their own sources of raw materials.
This research was sponsored by the RFH and the Republic of Bashkortostan in the framework of a scientific project number 16-11-02003.

10 PASTORAL MOBILITY IN BRONZE AGE LANDSCAPES OF NORTHERN KAZAKHSTAN: 87SR/86SR AND Δ18O ANALYSES OF HUMAN DENTITION

Author: Dr. Ventresca Miller, Alicia - Christian Albrechts University Kiel (Presenting author)
Keywords: Isotope Eurasia Network
Presentation Preference: Oral

The role of migration and mobility of people across the steppe have often been cited as key to Bronze Age developments across Eurasia involving the emergence of complex societies and the spread of material culture. The central Eurasian steppe (CES) is a focal point for the investigation of the shifting nature of pastoral societies, as a clear transition

occurred in archaeological patterning and the spatial extent of network interactions from the Middle to Late Bronze Age. The spread of Late Bronze Age (1700-1400 cal BC) Andronovo cultural materials across wide swaths of the steppe provide indirect evidence for broad scale interactions, but the degree to which people moved across the landscape remains poorly understood. This study takes a first step into documenting human movement during these critical periods through strontium and oxygen isotopic analyses of tooth enamel from the cemeteries of Bestamak (MBA) and Lisakovsk (LBA) in northern Kazakhstan. Strontium isotope results, referenced against the distribution of contemporary bioavailable strontium in the vicinity of both sites, suggest local communities engaged in small-scale mobility with limited ranges. Reduced strontium and oxygen isotopic variation visible in humans from Bestamak suggests mobility decreased from the Middle to Late Bronze Age likely indicative of a shift in resource and landscape use over time.

11 PASTORALISTS OF THE POVOLZHYE AS CATALYSTS OF TRANSFORMATIONS

Author: Professor Dr Vybornov, Alexander - Samara State University of Social Sciences and Education (Presenting author)
Keywords: pastoralists, technology, pottery
Presentation Preference: Poster

The steppe Povolzhye is the most important area: it is located near the Caucasus and Central Asia. It was there where cattle breeding and copper products early appeared. From 6500 to 5500 calBC Seroglazovskaya and Oryol cultures were developing in the steppe Povolzhye. They are characterized by microlithic flint tools, flat-bottomed pottery ornament with pricked ornamentation. Only hunting and fishing were presented. The Caspian Sea culture appeared around 5500 calBC. It existed there up to 4800 calBC. Raw materials for the tools were changed from flint to quartzite. There was a new stone processing technology and new types of products. Pottery gained new forms and types of ornaments. Only in vessels making technology old recipes were kept. Cattle breeding appeared in the household (sheep). The cause of transformation is not in the development Seroglazovskoaya and Oryol cultures but in the arrival of a new population. The bearers of Caspian Sea culture were moving north into the southern part of the forest-steppe Povolzhye. They gave an impetus to the development of the local population. Around 5000 calBC Khvalynskaya culture appears on the territory of the steppe Povolzhye. It existed there up to 4500 calBC. Flint raw materials prevail among the stone tools. The technology of reinforced pressing appeared. Large arrowheads, knives and scrapers were produced. The pottery was round-bottomed. The Caspian Sea culture tradition was traced in the technology of pottery making. Large necropolis appeared Copper jewelries of Balkan origin were known. The percentage of domestic animals increased. The Caspian and Khvalynsk cultures coexist from 5000 to 4900 calBC. The Khvalynskaya culture bearers penetrated one thousand kilometers to the north up to the northern borders of the Middle Povolzhye. They give a strong impetus for the transformation of the local population.
Project 33.1907.2017/PP

12 BONES OF THE BRONZE AGE: NEW APPROACHES TO STUDYING MICRO-REGIONAL INTERACTION IN SOUTHEAST KAZAKHSTAN

Author: Hansen, David - Nazarbayev University (Presenting author)
Co-Author: Hermes, Taylor - University of Kiel; Doumani Dupuy, Paula - Nazarbayev University; Frachetti, Michael - Washington University in St. Louis
Keywords: bioarchaeology, pastoralism, Kazakhstan
Presentation Preference: Oral

Bioarchaeology as a research methodology has only recently been utilized in Central Asian prehistoric archaeological research. There is a trend to view this region as a crossroads through which exchange happened, but this view often misses detailed reconstructions of micro-level interactions within communities and between individuals that make such dynamics possible. While there are many new directions in archaeological research that recognize local variability in pastoral lifeways in Eurasia, many of the interpretations are formed using cultural artifacts and environmental data without comparative assessment of bioarchaeological remains. For example, in the context of research in southeastern Kazakhstan, skeletal materials from the site complex of Tasbas/Dali have not been fully incorporated into parallel reconstructions of Late Bronze Age society, ritual, and economy. Thus, by drawing on osteological assessment of skeletal remains from the site, this paper examines the evidence for health and disease among its ancient inhabitants, and in turn investigates the individual against the backdrop of Bronze Age regional interactions. The paper will ultimately address questions on ancient identity, ritual systems, and economy among prehistoric pastoralist populations of Central Asia.

241 DO WE SPEAK THE SAME LANGUAGE? FOR A CONSTRUCTIVE DIALOGUE BETWEEN TOURISM AND ARCHAEOLOGY

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Dunning Thierstein, Cynthia (Switzerland) - ArchaeoConcept
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Keywords: tourism, archaeology, dialogue,valorisation, language
Presentation Preference: Round table

This transdisciplinary round table will discuss the importance of the day-to-day dialogue between these two important partners for the societal valorisation of heritage. Today we face new challenges that show that we need more than ever to cross the divide between economy and culture. On a practical level, communication between archaeology and tourism is way to build bridges between these two domains, and help us transmit knowledge about our Past. Having worked on the theme of the development of archaeo-touristic projects for more than four years, we believe that a regular exchange of ideas and real understanding between archaeologists and tourism specialists has not yet been achieved. This may have to do with the specific ways of thinking and expressions used in both domains.
Dialogue and training seem to be the main features needed to develop a common language Therefore we would like to engage a discussion in order to define useful propositions which can be applied to future projects.
To ensure a real communication during this round table, we will invite local tourism specialists to define a common language. Through the presentation of practical projects, ways of implementing a communication network and training possibilities will be also discussed.

01 WHAT YOU ALWAYS WANTED TO KNOW ABOUT TOURISM BUT NEVER DARED TO ASK

Author: Dr. Dunning Thierstein, Cynthia - ArchaeoConcept
Co-Author: Mr De Brouwer, Fabrice - Archaeoconcept (Presenting author)
Keywords: tourism, marketing, collaboration
Presentation Preference: Oral

The touring industry is regularly courted by the promoters of cultural tourism. If archaeologists want to belong here, they should be responsive and fit into these sales channels. This means a presence in tourism fairs, a skillful approach to agencies and a strong sense of communication to convince. The relational aspect in the tourism sector is crucial. Next comes the "exploitation" of an archaeological product that requires information tools developed under the supervision of archaeologists and adapted to different audiences. This openness to the world of tourism should be seen as a form of valorization, as was the case of the University of Coimbra, which held a stand at the BTL (Annual Tourism Fair in Lisbon) in 2016. The tourism industry works with a multitude of intermediaries: archaeologists can be one of these.
The opportunity can be great to understand these marketing mechanisms, because a return on investment is possible for the archaeologists. The profit is already due to the admission fee, to the paid guided tour.
An operator may, when the benefits of this collaboration are asserted, participate in the partial financing of the development of a site. The gradual emergence of the concept of sustainable tourism leads to a form of economic redistribution that is interesting for its communication, the moralization of its activity and for tax purposes.
On the other hand, the archaeologist should ensure the quality of the information delivered on his site by overseeing the essential work of the mediators. The extent to long-term visits to a site depends on the quality of the work of cultural mediators. If, for the archaeologist, authenticity and conservation of the site are key values, the travel operator must be convinced to justify a destination. The feed-back is given by his customers.

02 TOURISM EXPERTS VERSUS ARCHAEOLOGISTS

Author: Castillo, Alicia - Complutense University of Madrid (Presenting author)
Keywords: Stereotyped/conflicted visions
Presentation Preference: Oral

For this round table, I think it would be interesting to delve into stereotypical views of what archaeologists and tourist experts do in order to challenge these images but also to find areas where both approaches converge.
Here a draft of topics to discuss in the roundtable

OPPOSING VIEWS?:

Tourism:

Prioritised audience: tourists
Multivocal discourses
Main focus: tourists' comfortability
Enjoyment of, over sensibility towards, cultural diversity
Form over content
Branding
Authenticity as experience
Profit-making
Focus on the outstanding and unique
Work on sites as paid work
Private profit-making

Archaeology:

Prioritised audience: local communities
Archaeological/touristic discourses
Main focus: archaeological sites protection
Sensibility over enjoyment
Content over form
Scientific rigour
Authenticity as historic/material rigour
Knowledge- making
Main focus on the everyday and quotidian
Work sites heavily based on volunteering
Archaeology as source for sustainable development

03 210 BC - THE CONQUEST OF AKRAGAS - A CASE OF ARCHAEOLOGICAL POPULARIZATION IN SICILY

Author: Miss Speciale, Claudia - PastActivity (Presenting author)
Co-Author: Miss Danile, Laura - PastActivity; Mr Virruso, Giovanni - PastActivity
Keywords: Sicily, Reenactement, Akragas
Presentation Preference: Oral

The cultural association PastActivity was born in 2016 from the idea of two archaeologists, Laura and Giovanni, along with the external cooperation of a third one, Claudia. They have been working in museums and popularization in archaeology for several years. PastActivity's main goal is the valorisation of the landscape and the cultural heritage through a better knowledge and understanding of the past and of its traditions.
Our first project aimed to organize an event of didactic archaeology and historical re-enactment in the Archaeological Park of the Valley of the Temples of Agrigento (Sicily, Italy): 210 BC – The Conquest of Akragas.
Among our partners, we had the chance to collaborate with some local actors that helped us in the shaping of the project and the achievement of some goals for the organisation and advertisement of the event. Nevertheless, the collaboration with the regional and national organizations involved in the touristic promotion of our territories are still linked to a more "static" concept that is not embracing the new means of communication in archaeology yet. Schools and single visitors were easier to attract than groups managed by tour operators. Thanks to our team work on the territory, we had the chance to involve the local public. Social media were definitely one of the best strategies to expand our tourist offer and attract new segments of public.

242 THE ARCHAEOLOGY OF EUROPEAN PEATLANDS FROM AN INTERDISCIPLINARY PERSPECTIVE: HOW TO MOVE FORWARD?

Theme: 6. Interpreting the archaeological record
Author: van Beek, Roy (Netherlands) - Wageningen University & Research
Co-Author(s): Gearey, Benjamin (Ireland) - Department of Archaeology, University College Cork, Connolly Building, Dyke Parade, Cork, Ireland.
Keywords: peatlands, interdisciplinarity, palaeoenvironment, conservation, management
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Raised bogs may contain high-resolution data on past climate, landscape change and human activity, which cannot be retrieved from other landscape contexts. However, detailed studies from a landscape-oriented and cultural perspective are exceedingly rare – aside from some important exceptions from Britain and Ireland. Furthermore, the lack of interdisciplinary cross-fertilisation hampers realisation of the full scientific potential and the development and promotion of the broader cultural and heritage significance of these ecosystems. This is alarming, because the majority of northwest European bogs have been lost due to peat-cutting and reclamation, and the remainder is under major threat from processes including climate change, agriculture and pollution. This session calls for the development of proactive strategies for the assessment and sustainable management of peatlands, through constructive dialogue between archaeologists, palaeoenvironmentalists and other scientists, local authorities, government agencies and stakeholders such as conservation bodies. We hope to consider peatlands from a diversity of angles, and discuss how to move forward productively in the future. We welcome contributions across the following three themes:

1 The development and integration of new theoretical and methodological approaches to peatlands as archaeological landscapes;
2 The practical integration of data from various disciplines involved in peatland research (e.g. earth sciences, archaeology, biology, historical geography and the humanities);
3 Bridging gaps between archaeological and palaeoenvironmental research and peatland conservation/management strategies and promoting constructive dialogues between different stakeholders.

01 EUROPEAN PEATLANDS - ARCHAEOLOGY, HERITAGE, CONSERVATION: DEVELOPING NEW AGENDAS?

Author: Dr Gearey, Benjamin - Dept Archaeology, University College Cork (Presenting author)
Keywords: peatlands, heritage, interdisciplinarity
Presentation Preference: Oral

"The well proven, extensive and rapid destruction of waterlogged archaeological deposits in European peatlands should be regarded as a significant crisis." (Brunning 2007)

The failure of attempts to protect archaeological sites and deposits, or in many areas to adequately mitigate for destruction in various countries in Europe, has meant that peatland archaeology has spent much of the last two decades fighting a losing battle. This paper will argue that we need to develop new connections, attitudes and approaches to European peatlands, in order to promote, and protect those deposits and sites which have survived into the 21st century. In particular, it will suggest that we need to think about broader connections between diverse areas of enquiry and expertise, ranging from the sciences to the arts and encompassing equally broad themes. The importance of collaboration and communication across interest groups and disciplines will be illustrated with case studies from ongoing work in Ireland and the UK.

Brunning, R. 2007. Monitoring waterlogged sites in peatlands - where, how, why and what next? In Archaeology from the Wetlands: Recent Perspectives, WARP Edinburgh, 191-198.

02 PEATLAND ARCHAEO-ENVIRONMENTAL STUDIES AND ECOCRITICAL THOUGHT: EXAMPLES FROM IRISH PEATLANDS

Author: Stastney, Phil - University of Reading (Presenting author)
Keywords: ecocriticism, peatlands, Ireland
Presentation Preference: Oral

There remains something of a gap between "science-based" palaeoenvironmental studies and "humanities-based" approaches to peatland archaeology. This shortage of interdisciplinary working arguably limits the creation of coherent narratives that could otherwise make an important contribution to wider public debates around conservation, cultural heritage and adaption to present and future climate change. Important lessons in this respect may be drawn from developments in the field of literary criticism which has consciously addressed these debates in response to the growing recognition of widespread environmental degradation and anthropogenic climate change. The emergence in

recent decades of an 'ecological' literary criticism ('ecocriticism') may provide opportunities for further integration between sciences and the humanities in the field of human-environment interactions in peatlands. Issues such as the definition of appropriate spatial and/or temporal scales for understanding social and environmental change ('scale framing'), the delineation between 'cultural' and 'natural' spheres, and the recognition of cultural attitudes towards natural environments (e.g. 'ecophobia') are actively addressed by ecocriticism and are of direct relevance to the interpretation and presentation of peatland archaeological data. Utilising worked examples from raised bogs in central Ireland, this paper will discuss how insights from ecocritical readings of literary texts may provide both a useful resource for archaeologists working with peatland archaeological and palaeoenvironmental datasets, and a means of connecting with wider public and political discourses.

03 HYDROLOGY AND HUMANS: INTERPRETING THE 'BULK' ARCHAEOLOGICAL AND CLIMATE RECORDS FROM RAISED PEATLANDS IN IRELAND

Author: Dr Young, Daniel - University of Reading (Presenting author)
Co-Author: Dr Stastney, Phil - University of Reading
Keywords: Peatlands, hydrology, trackways
Presentation Preference: Oral

Raised bogs are valuable terrestrial archives of both climate change and prehistoric human activity, revealing evidence for significant centennial/decadal scale climate events and distinct phases and lulls in the archaeological record. However, recent compilations of palaeohydrological records from such sites have revealed evidence for significant inter-site (potentially autogenic) variability, particularly at decadal to centennial scales. Whilst recent investigations have revealed some evidence for a relationship between peatland hydrology and human activity at individual sites, broader patterns have been inconclusive, leading to the conclusion that the timing and extent of peatland use was not climatically-determined. The palaeohydrology of ten raised bogs in central Ireland has been reconstructed using plant macrofossil analysis (supported by testate amoebae data), providing a reconstruction of changes in bog surface wetness (BSW) (driven by summer precipitation and temperature). These palaeohydrological records have been compared to site-specific and broader Ireland-wide archaeological datasets in order to examine the evidence for a predictable, consistent relationship between human activity and BSW. The palaeohydrological records are indicative of a combination of both local variability and climatic forcing; however, using the 'time-window' approach the data has provided evidence for regional transitions to wetter conditions indicative of climate forcing. Comparison of the palaeohydrological and archaeological datasets indicates that at individual sites, human activity was more likely to occur in drier bogs. However, no clear linear relationship between climate change and human activity at the broader regional/sub-regional scales could be identified. The apparent contradictions between the interpretation of the data at regional/sub-regional and local scales highlight the issues of chronological uncertainty and local variability in both archaeological and palaeohydrological records. Investigations of human-environment interactions should examine these relationships on a site-by-site basis, to provide a more detailed understanding of the complex relationships between human activity in peatlands, local environmental conditions and regional climate change.

04 RECONSTRUCTING SPATIO-TEMPORAL BOG DEVELOPMENT IN THE HOLOCENE

Author: MSc Quik, Cindy - Soil Geography & Landscape Group, Wageningen University & Research, Postbus 47, 6700AA, Wageningen, The Netherlands (Presenting author)
Keywords: Lateral bog expansion
Presentation Preference: Oral

Peat profiles contain a high-resolution chronological record of changes in vegetation, climate and human activity. Therefore an interdisciplinary outlook is required to harness the full scientific potential of peat archives. Lateral bog expansion significantly alters the physical landscape and understanding the timing, process rates and spatial dynamics of bog expansion is crucial to analyse patterns in human occupation. However, apart from some Irish and Scandinavian studies, peat inception and lateral bog expansion have received remarkably little attention. In this paper we introduce a study that aims to provide the necessary physical-geographical information on spatio-temporal bog development during the Holocene to allow a detailed, integrated inquiry on the relationships between physical bog environment and cultural patterns. To this end three study areas have been selected in different parts of the Pleistocene sandy landscapes of the Netherlands; areas that are representative for larger parts of the northwest European plain. To arrive at the aimed reconstruction of bog development we will make use of a multiproxy analysis based on high-resolution data, combining information on stratigraphy, soils, elevation (and Pleistocene topography), AMS dating of basal peat layers, and possibly data on pollen and macrofossils. This reconstruction will help elucidate (variations in) process rates of lateral (and possibly vertical) bog expansion through time, and the integration of three study sites allows to differentiate between regional and supraregional trends in bog development. A core element will be the development of appropriate model and survey techniques to arrive at the above-mentioned goals. Results will be placed in the context of Holocene climate change and will be combined with archaeological and historical-geographical studies.

05 BOG ARCHAEOLOGY IN THE NETHERLANDS: TOWARDS A NOVEL APPROACH

Author: Dr Van Beek, Roy - Wageningen University & Research (Presenting author)
Keywords: bogs, archaeology, interdisciplinarity
Presentation Preference: Oral

Relations between archaeological data and Dutch bogs bogs have been studied from two perspectives. The first approach focuses on single finds or structures (e.g. wooden trackways) that were discovered in the distant past during peat-cutting. Various spectacular finds are known, which feature prominently in academic and popular literature, but have hardly been contextualised properly yet. The second approach centers on links between lateral bog expansion and regional habitation patterns. These environmentally determistic studies generally do not pay attention to socio-cultural aspects. Both perspectives lack integration and offer only limited insights into human-bog relations. As such, the full archaeo-environmental potential of bogs has not been realised yet. In this lecture it will be argued that a novel approach is needed to bridge the gap between regional and site/object-based information and to lift interpretive frameworks to a higher level. This includes studying relations between archaeological and environmental data on different spatial levels. Furthermore it is essential to look beyond current bog remnants, as far larger areas were once covered with peat than today, and to compare the character and pace of long-term developments in bogs and neighbouring drylands in detail.

06 RECONSTRUCTING SPATIO-TEMPORAL TRENDS IN BOG EXPLOITATION AND RECLAMATION IN THE LOW COUNTRIES

Author: Mr Paulissen, Maurice - Wageningen University (Presenting author)
Keywords: bogs, reclamation, interdisciplinarity
Presentation Preference: Oral

Large parts of the Dutch sandy soils and adjacent parts of the Northwest European plain were once covered by raised bogs. In particular in the Netherlands, most of these have disappeared since the Medieval Period due to reclamation and peat exploitation. What remains is natural and cultural heritage under pressure. Given the rarity of bog remnants, current environmental pressures on them, and the unique character of bog reclamation landscapes from an international viewpoint, there are important knowledge gaps relating to the history of human bog use and conversion. Research has traditionally focused on data collection and description, mostly in regional studies. There is a need for contextualisation and interpretation from a wider spatial and temporal perspective. As environmental and cultural data on bog use have hardly been integrated, an interdisciplinary approach is essential. Moreover, no proactive strategies have been designed for sustainable management of bog-related cultural phenomena and historical bog reclamation landscapes. Fortunately, the potential of the available datasets is high. Dutch data on archaeological finds, habitation patterns and reclamation history are relatively detailed. This paper introduces a new project that aims to (1) analyse spatio-temporal trends in bog reclamation and exploitation in the 'upland' parts of the Netherlands and adjacent areas since the Middle Ages; (2) analyse the survival of remains from different 'time-layers' in the modern-day landscape; (3) contribute to proactive strategies for the sustainable management of bogs and their cultural heritage. We will apply a multiproxy approach including analysis of archival and literature sources, physical-geographical databases and fieldnames, and will focus on three to six study areas. The study will provide the first detailed overview of bog reclamation developments in the Netherlands and adjacent areas, from a novel landscape-oriented and interdisciplinary approach.

07 PRESERVATION OF A BLOCK OF RAISED BOG AND A PREHISTORIC TRACKWAY IN THE MIDDLE OF PEAT CUTTING

Author: Dr. HEUMUELLER, MARION - Lower Saxony State Service for Cultural Heritage (Presenting author)
Co-Author: Pilling, Robin - NLWKN, Lower Saxony Water Management, Coastal Defence and Nature Conservation Agency
Keywords: trackway, bog, preservation
Presentation Preference: Oral

About 350 prehistoric trackways are known from Lower Saxony, respectively the Northwest of Germany. The majority of these routes have been destroyed in the course of time by peat harvesting and agricultural use. This also includes the 2000 year old trackway Pr VI in the Aschen-Brägeler Moor (Lkr. Diepholz), which was with a length of four kilometers one of the longest prehistoric timber structures in North Western Europe. Today only a small distance of about 1000 m survives.
In the middle of an active peat harvesting area there still exists an untouched block of raised bog, which is today as far as two meters higher than the surrounding area. After a decade-long dispute over the mining of the peat, last year the NLWKN, the Lower Saxony Water Management, Coastal Defence and Nature Conservation Agency, bought the 400 x 320 m big area, with the aim to preserve the still existing raised bog vegetation and the trackway, which today is located in in a depth of 1.30 to 2.30 m.
Since then, first efforts are made to raise the hydrological balance in the peat. The vegetation which is not belonging to a typical raised bog is removed. In the near future the run-off of precipitation water is to be stopped and the water levels monitored in the course of the year. Because the project just started, there are still various possibilities in planning. The lecture presents some new archaeological data and the measures to receive this block of raised bog as a nature and archaeological archive.

08 THE PEAT DEPOSITS FROM BRUSSELS (BELGIUM): THE HOLOCENE EVOLUTION OF THE LANDSCAPE IN THE SENNE VALLEY

Author: Dr Marinova, Elena - Royal Belgian Institute of Natural Sciences
Co-Author: Mr Devos, Yannick - Université Libre de Bruxelles, Centre de Recherches en Archéologie et Patrimoine (Presenting author); Dr Degraeve, Ann - Department of Archaeology, Brussels Regional Public Service; Ms Modrie, Sylvianne - Department of Archaeology, Brussels Regional Public Service; Mr Van Bellingen, Stephan - Royal Museums of Art and History, Brussels
Keywords: peat, Brussels
Presentation Preference: Poster

Whereas the evolution of the land cover of the Holocene landscape is rather well documented for the main basin of the Scheldt river (Verbruggen et al., 1996), the vegetation history of Senne valley remains poorly documented.
Over the last decade, during the systematic archaeological survey conducted by the Direction of Monuments and Sites of the Brussels Capital Region, several exceptionally well preserved meters thick peat deposits have been discovered in the historical centre of Brussels and its surroundings. The first results of the palynological, paleofire and geoarchaeological studies reveal a nearly continuous sequence throughout the Holocene. The interdisciplinary study of these deposits offer a huge potential to explore the evolution of the paleoenvironment in the river valley and further to contribute to spatial reconstructing the landscape development of the area trough the time. As the sites are situated as well in the historical city centre as in the surrounding area it will also allow us to reconstruct the impact of the urbanisation on the natural vegetation and transformation of the peatland ecosystem into urban and cultivated areas in Brussels and its immediate surroundings.

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09 WHITE SEA ISLANDS: HISTORY OF VEGETATION AND HUMAN OCCUPATION

Author: Ms Smyshlyaeva, Olyesya - Moscow State University, Moscow, Russia (Presenting author)
Co-Author: Dr Kozhin, Mikhail - Moscow State University, Moscow, Russia; Ms Medvedeva, Elizaveta - Moscow State University
Keywords: palynology, vegetation, peat
Presentation Preference: Poster

The archipelago "Por'ya guba" is located in the Kandalaksha gulf of the White Sea. The landscapes of continental coast and of the archipelago have a long history, which is linked with the isostatical uplift during the last 12 thousand years. Along with the land uplifting, quite distinctive island ecosystems have been gradually forming. It is known that the coast of the "Por'ya guba" was inhabited since the Neolithic. But the history of the island's occupation has not yet been studied. We investigate peat bogs located at different

altitudes with pollen, botanical and radiocarbon analyses.This allows us to reconstruct the dynamics of the shoreline and vegetation successions. Our data also revealed several periods of local anthropogenic activity. Some traces of fires, deforestation, and agriculture were identified on the islands and on the coast.

249 ROMAN LOGISTICS UNRAVELED: THE ORGANIZATION OF TRADE AND TRANSPORTATION OF BULK GOODS

Theme: 6. Interpreting the archaeological record
Author: Kars, Eva (Netherlands) - EARTH Integrated Archaeology B.V.
Co-Author(s): Vanderhoeven, Timo (Netherlands) - EARTH Integrated Archaeology B.V.Clerbaut, Tim (Belgium) - Historical Archaeology Research Group (HARG) at Ghent University
Keywords: roman, logistics, strategy, transportation, organization
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Since the convent of Valetta and the introduction of commercial archaeology research is mainly focused on single sites. Because of the crisis in the European building sector since 2008, prices of archaeological research have lowered drastically and investigations have been reduced to collecting data, instead of interpreting the archaeological record and forming new hypotheses. Unfortunately the focus of research nowadays lies mostly on revealing traces and structures and dating recognizable (small) finds.
Research on logistics and distribution is a tool to unravel the organization of the Roman economy. A key player is, without doubt, the Roman army. Research on roman military logistics is unfortunately often restricted to the distribution of small finds like pottery, glass and metal objects. However, the scale of the trade in heavy building goods, such as timber, stone and ceramic building material, has always been way bigger in volume as well as in financial turnover. Because of the bigger impact of this trade, it requires a higher level of organization. Therefore to understand the organization of roman logistics it is important to look at heavy goods.
This session will discuss the logistics of heavy goods and the organization of the construction of roman roads, forts and public buildings. Can we unravel the strategy behind roman logistics? Can we estimate the volumes of transportation and the impact on society? Can we recognize a division between military and civil trade and transport? How does the movement of military units relate to the movement of goods?

01 BURDENS OF THE BEASTS AND MEN IN ROMAN LOGISTICS

Author: PhD Student Varakas, Katja - University of Helsinki (Presenting author)
Keywords: roman, logistics, transportation
Presentation Preference: Oral

Indeed, research on logistics and distribution is a tool to unravel the organization of the Roman economy. The topic of logistics or transport has often been approached in a tone of controversy and polemic. Until the 1970s the subject of transport was seldom treated in studies of economic history.

The direct sources shedding light on trade and transport in Roman time seem to be few and scattered; therefore the analysis tends to be complex. The material consists of different sources, for example, Latin literature and visual representations. We find in ancient world that different transport methods were commonly used; pack-animals, men and carts carrying loads were a common sight. And it even seems that the problem of transport was a constant concern both rural and urban life. Poet, play and agricultural writers have several descriptions of civil trade and transport scenes. On the other hand visual representations depict scenes that paint a picture of a physical movement and an essential role of logistics in ancient life. Visual art may even shed light on some of the written sources.

This paper addresses the phenomenon only with few examples. My aim is to compare, how written and iconographic sources differ from each other, if at all. Why should an elite member of Roman society or a play writer even want to depict scenes of urban logistics and the transport of bulky goods? What can we learn from the epitaphs of traders and transport personnel?

02 THE ROMAN MILITARY LOGISTICS WITH SPECIAL RESPECT TO BUILDING MATERIALS WITHIN THE BARBARIAN TERRITORY OF THE MIDDLE DANUBE REGION

Author: Mgr. PhD. Vlach, Marek - Institute of Archaeology of the Czech Academy of Sciences Brno (Presenting author)
Co-Author: Mgr. Ph.D. Komoróczy, Balázs - Institute of Archaeology of the Czech Academy of Sciences Brno; Dr. Hüssen, Claus-Michael - Römisch-Germanische Kommission des Deutschen Archäologischen Instituts
Keywords: camps logistics bricks
Presentation Preference: Oral

Romano-Germanic relations in the Middle Danube region during the Roman Period are characterized through the wide range of forms of interaction, oscillating variously between violent conflicts and diplomatic relations. Group of direct and indirect evidences of the Roman military presence during the Marcomannic wars even in remote regions of the Germanic territories has been enriched significantly during the last years and enabled new interpretation possibilities. Available archaeological record provide multiple evidences of substantial large-scale building activities, underlined above all by structures found in the central military base Hradisko at Mušov. Among others there have been also excavated buildings with construction consisting of a specific bricks series manufactured by the 10th legion in Vindobona. Their transportation deep into the barbarian territory imply very sophisticated system of security and use of navigable regional river routes. Nevertheless, there are also evidences of relatively complex building techniques in case of field camps of temporary nature. Exceptionally important is finding that in case of fortification construction of even the most spacious camps have been used technologically and logistically demanding building material. Such building projects required substantial manpower, organizational resources, and transportation capacities, which are generally embodied in the Roman army properties. The stable military presence, despite only for a shorter period of time, within the "barbarian" hostile environment, underdeveloped from perspective of available infrastructure, puts significant load on the of the military logistics performance. Considering quantitatively pronounceable requirements and cost, including vastly demanding subsistence upkeep, put such foreign campaign into remarkable perspective of military economics.

03 AN INTRODUCTION TO ROMAN BUILDING LOGISTICS: SOME THEORY AND ARCHAEOLOGICAL EVIDENCE BASED ON THE STUDY OF (CERAMIC) BUILDING MATERIALS.

Author: Doctorandus Clerbaut, Tim - Ghent University; FORTVNA (Presenting author)
Keywords: roman construction logistics
Presentation Preference: Oral

In this paper the general topic of this session will be explored by looking at the Roman building industry and its logistical challenges. An introduction will be provided on the subject by sketching the position of the Roman building industry within the broader framework of the Roman economy (of bulk goods). Particular attention will be giving to different intrinsic characteristics of this well organized economical branch such as dealing with large scale demand, production and transportation. In this discussion, also aspects of recycling, reuse and reworking of material will be addressed.
Several case studies will illustrate how the Romans dealt with these organizational challenges when providing wood, stone, brick and other building materials for various building projects. Special attention will go to the archaeological visibility of these processes and some techniques that can aid in enlarging our knowledge on the matter.

04 LOGISTICS BEHIND ROMAN BUILDING MATERIAL IN THE NETHERLANDS

Author: Mrs Kars, Eva - EARTH Integrated Archaeology B.V.
Co-Author: Mr Vanderhoeven, Timo - EARTH Integrated Archaeology (Presenting author)
Keywords: logistic building material
Presentation Preference: Oral

Since 2000 the authors have been investigating Roman heavy goods (ceramic and stone building material) deriving from 35 commercially excavated sites in the Netherlands. From every site reference samples are collected, documented and stored. The ultimate aim of the project is to connect fabrics with producers and ascribe stones to quarries and discern the provenance of the natural resources. Through the years a large reference collection has been built up. With every new investigated site the collection provides a greater opportunity to postulate new hypotheses and arrive at exciting conclusions.
This lecture will discuss why it is so important to study the logistics of heavy goods, in particular the organization of the construction of roman roads, forts and public buildings. Can we unravel the strategy behind roman logistics? Can we estimate the volumes and type of transportation and the impact on society? Can we recognize a division between military and civil trade and transport? How does the movement of military units relate to the movement of goods?
Using some case studies from the Netherlands the authors will show how new ways of approaching the material can provide us with new insights.

251 DESCRIBE YOUR DATA: THE CRM APPROACH TO ARCHIVING AND EXCHANGE OF ARCHAEOLOGICAL FIELD DATABASES

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Van Leusen, Martijn (Netherlands) - University of Groningen
Co-Author(s): Felicetti, Achille (Italy) - University of Florence, Polo universitario of PratoDe Haas, Tymon (Netherlands) - University of Groningen; University of Cologne
Keywords: research data management, archiving, CIDOC-CRM
Presentation Preference: Round table

Despite the seemingly endless variation in the approaches taken by archaeologists when conducting field studies (especially during 'surveys'), on analysis it appears that we all make use of the same set of underlying concepts in designing our research and in documenting our data. Thus, agreeing on a joint 'conceptual reference model' or CRM opens the way to describing individual field datasets in an unambiguous way, allowing effective archiving and exchange of such data without prescribing standards for the fieldwork itself.
This roundtable brings together those already involved in the design of archaeological CRM, those responsible for the proper archiving of archaeological field data, and those interested in learning about current documentation standards. It aims to foster collaborations and joint national and international funding applications in the area of research data management.

255 NEW DIRECTIONS IN ARCHAEOLOGICAL STUDIES 1500 – 2000

Theme: 6. Interpreting the archaeological record
Author: Mytum, Harold (United Kingdom) - University of Liverpool
Co-Author(s): Orange, Hilary (Germany) - Ruhr-Universität Bochum, Germany; University College London, UK
Keywords: Historic, post-medieval, late-medieval, heritage management
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

MERC
Medieval Europe Research Community

This Session explores the methodological and theoretical diversity of approaches that are being currently applied to the archaeology of recent centuries. From standing buildings to the smallest portable artefacts, from those supported by well-documented contexts to those missing from history, this archaeology has profound social and political reverberations in contemporary Europe. Much of heritage management is also engaged with remains from this recent past, yet in many parts of Europe it has yet to receive the archaeological attention it deserves. This session will highlight the potential for such evidence and provide examples of research, management, and public interpretation through case studies.

01 ENVIRONMENTAL JUSTICE AND HISTORICAL ARCHAEOLOGY OF THE SUBALTERN

Author: Professor Svensson, Eva - Risk- and Environmental Studies, Karlstad University (Presenting author)
Co-Author: Dr Nilsson, Pia - Arkeologerna, Statens Historiska Museer; Associate Professor Hansson, Martin - Department of Archaeology and Ancient History, Lund University
Keywords: EnvironmentalJustice Subaltern HistoricalArchaeology
Presentation Preference: Oral

This paper will present a new research project on subaltern lifescapes, and a case study to illuminate the project. In the project living conditions, economies, strategies, lifestyles and material cultures of subalterns and non-proprietors in different socio-environmental contexts in Sweden are studied from an Environmental Justice-perspective. Environmental Justice is addressing how social stratification, (lack of) access to power, environmental degradation and risk exposure are intersecting, thus enforcing the unjust living conditions of the subalterns, and the importance of empowerment strategies for reversing the situation. The chronological focus is c. 1700-1900, a period that included large scale structural changes such as modernization, urbanization, industrialization and environmental degradation.
The project will use different source materials; historical archaeological material, written documents, historical maps, ethnographic documentations, biological heritage, standing buildings both for triangulation and comparison. The method of combining different source materials opens for new possibilities to studying the daily life of otherwise hidden groups of people, such as subaltern categories. The project will also contribute to development of skills and methods in heritage management in relation to historical archaeology.
In the case study we will meet a small crofting community, Pinoberget, where crofters created a diversity of lifescapes in between rural and industrial economies and authorities in the 19th century. The crofters were dependent on a variety of different incomes, including jobs provided by an iron works and a farming community nearby. However, some of the crofters at Pinoberget found different strategies relying on the resources in their landscape and their social connections to challenge authorities and create more dignified lifescapes, whereas others lived under more severe conditions.

02 MATERIALITY AS A BASIS IN CONSTRUCTING A NEW MEMORY OF THE CARLIST CONFLICT

Author: Roldan-Vergarachea, Ivan - University of the Basque Country (UPV/EHU); Arcadis (Presenting author)
Co-Author: Dr Escribano-Ruiz, Sergio - University of the Basque Country (UPV/EHU)
Keywords: Contemporary, Conflict, Memory
Presentation Preference: Oral

Carlist Wars took place in Spain during the 19th century but must be understood into the wider context of the counterrevolutionary movement which occurred in all over Europe at that time. Those armed conflicts gave rise to the construction of romantic memories that relied on a mythic and biased vision of historical events. The so created idealistic memories are exemplified by the divinization of some war heroes or in the keeping of familiar memories. Nonetheless, traumatic war events also originated a parallel process based in the forgetting of specific aspects; especially issues related to the military part of the conflict, such as war scenarios or army related routines. The pain of memory triggered a general amnesia that has manifested itself by socially ignoring the material legacy of the conflict. A diverse heritage comprising forts, towers, trenches and battlefields, is being destroyed by the inexorable passage of time and due to a lack of preservation policies. With the aim of counteracting this mnemonic collapse, we started the first archaeological research program carried out by a Spanish University on this subject. Not only to study the Carlist Wars themselves, but as a mean of recovering a memory that, even being close to extinction, would help in creating ties of identity, affectivity and respect.

03 AR SCÁTH A CHÉILE A MHAIREANN NA DAOINE: HOUSEHOLD AND MATERIALITY IN 18TH-19TH CENTURY ACHILL ISLAND, IRELAND.

Author: Ms Campbell, Eve - Achill Archaeological Field School (Presenting author)
Keywords: Ireland, ceramics, historical
Presentation Preference: Oral

In 1845, on the eve of the Great Irish Famine, some 8% of land in Ireland was held under a co-tenancy system known to contemporary writers as 'rundale'. While acknowledged to present diverse spatial forms, rundale is frequently connected with so-called 'clachans' or farm clusters, common arable infield, and common outfield or rough grazing. This settlement form was once ubiquitous, finding its densest concentrations along the western Irish seaboard. Rundale seriously declined in the latter half of the 19th century, undermined by demographic changes wrought by mortality and emigration, coupled with agricultural reforms enacted after the Famine. While questions over the origins and character of rundale have engendered vigorous debate, chiefly among historical geographers, many questions concerning its development, spatiality and material culture(s) remain. This paper will present recent work by the Achill Archaeological Field School at the pre-Famine rundale settlement of Keem, Achill Island, in the west of Ireland. Between 2009 and 2016 AAFS carried out a programme of excavations at Keem, examining two dwellings and associated features in the settlement. These works have provided an important window into life in pre-Famine Keem. In particular, they have elucidated architectural forms and material culture, shedding light on household, community and connections between Keem and the wider world. This paper will focus on evidence for household and materiality at Keem. Special attention will be paid to the ceramic assemblage from the site exploring the roles of ceramics in materialising social relationships within the community, through the practices of eating, curation and display.

04 COMBINING HISTORICAL SOURCES WITH ARCHAEOLOGICAL MATERIAL AT AN EARLY MODERN RURAL SITE – AN EXAMPLE FROM SOUTHERN FINLAND

Author: MA Heinonen, Tuuli - University of Helsinki (Presenting author)
Keywords: historic, early-modern, rural
Presentation Preference: Oral

Traditionally, the image of early modern farmers has been quite static in Finnish historiography, and the peasants have been thought to form a fairly uniform group. However, the archaeological material gained from the rural excavations in Southern Finland in recent decades has shown, how varied the material culture was in the early modern villages and hamlets. When the archaeological material is combined with the written sources from 16th and 17th centuries treating the rural population, a more diverse picture can be formed of both single farms and villages, as well as of the early modern society on a larger scale.

The example from the farm Lillas, located in Uusimaa, Southern Finland, shows how varied a picture of an early modern farm and its inhabitants can be gained, when historical and archaeological material are used together in a detailed analysis. When the material treating Lillas from 1540's to 1700 was analyzed, much information could be collected on the farm's inhabitants and their wealth, connections, livelihoods, built environment and objects they used. It became clear that the inhabitants of the farm weren't simply farmers in the period, but moved between different social groups as a result of the active choices the made. This clearly questions the traditional view of the early modern peasantry

forming a uniform social group. The example of Lillas shows well, how a detailed analysis of both archaeological and historical material on a household level can also give new perspective on early modern rural population on a more general level.

05 A FORTIFIED LANDSCAPE IN THE MODERN ERA: THE DIFFERENT PERCEPTION OF HERITAGE BETWEEN TWO COUNTRIES

Author: Miss Blanco-Rotea, Rebeca - Santiago de Compostela University (Spain); Minho University (Portugal) (Presenting author)
Keywords: Post-medievalArchaeology, PortugueseRestorationWar, HeritageManagement
Presentation Preference: Oral

Over the last two decades the fortified landscape of the North frontier between Spain and Portugal, known as Raia Húmida, has been studied and analyzed from an archaeological approach. The devising of a Master Plan, whose objectives where to preserve, protect and enhance the built heritage of the region set the foundation stone for the development of different actions that included archaeological studies. Lately, the progress and discoveries made allowed the drawing of a research program based on fortified landscapes in the Modern Age.
Through a methodological approach based on Landscape Archaeology and Building Archaeology those structures constructed during the Portuguese Restoration War (1649–1668) are now understand as a defensive military complex, whose emplacement and interaction are directly related to the territory they aimed to protect.
Being a shared heritage between two countries has resulted in two different courses of action, concerning the heritage policies and process as well as the social perception of this historical episode and its remains. This reality supports the idea that the preservation, management and enhancement of the fortified landscape of Raia Húmida should be carried out as a joint effort.
The aim of this presentation is precisely to prove how the archaeological studies turned out to be the perfect tool for the redefinition of the citizen's relationship with this heritage, acclaimed and recognized in the Portuguese riverside and forgotten in the Spanish.

06 CONTEMPORARY COMMEMORATIONS OF THE NAPOLEONIC WARS

Author: Nienhaus, Luisa - UCL Institute of Archaeology (Presenting author)
Keywords: Napoleonic, Commemoration, Europe
Presentation Preference: Oral

This paper examines the contemporary and historical commemoration of the Napoleonic Wars. It examines the questions: how does the aftermath of the Napoleonic Wars impact in our lives today, both ideologically and materially? How do European populations perceive and experience sites of war commemoration and what value do they have for them? How do sites of war commemorations such as monuments, memorials and museums become focal points of tourism as well as the promotion of European ideas?

To address these questions I have chosen two battles; the Battle of Nations (1813) in Germany and the Battle of Waterloo (1815) in Belgium. Both sites are significant turning points in European history and are focal points for commemorative events as well as dark tourism. This research draws on a mixed methods approach including both literary and ethnographic research such as visitor observations and surveys. My preliminary results indicate that both the ideological as well as the material value of the commemorations of the Napoleonic Wars and their case studies are of significance for the wider public. They furthermore indicate that this significance can be found on both national as well as European levels. This research has implications for the study of war commemoration, dark heritage, dark tourism and the formation and reformation of European identities.

07 ARCHAEOLOGY OF MODERN TIMES CONFESSIONALISATION. BALTIC REGION CASE STUDY.

Author: Dr Romanowicz, Paulina - Institute of Archaeology and Ethnology, Polish Academy of Sciences (Presenting author)
Keywords: Modern-Times, Reformation, ideology
Presentation Preference: Poster

During the first half of the 16th century the whole Europe was shaken by social and religious revolution, which had a very strong influence on the culture, also in its material aspect. The Reformation and Couterreformation movement in the Baltic Region mixed with the social and economic dissatisfaction, and gave rise to breakthroughs in culture, education, politics and the economy.
Confessionalization is a concept introduced by the historians of the Reformation, describing processes in parallel building new forms of Christianity, which took place in the period from the Peace of Augsburg (1555) and The Thirty Years' War (1618-1649). This time is seen as the nominal period of peace, in which both factions, Roman Catholics and Protestants, competed for dominance, basing on social disciplining followers.
One of the remains of this confeesionalisation penetrating deep into the daily lives of believers are archaeological finds of ceramics, tiles or glass dishes, enriched with iconographic ideological programme.
This is the main aim and task to describe the changes in daily lives of the ordinary people that are visible throught this material culture brought by the sixteenth-century reform of Christianity in Europe. To look at changes in the use of sacred space, to analyze the use of everyday objects as the religious ones and to investigate the changes in funeral practices.

08 DIASPORA AND IDENTITY: AN ARCHAEOLOGICAL AND HISTORICAL INVESTIGATION INTO MATERIAL LIFE, ETHNICITY, AND DIET IN THE DISTRICT OF VLOOIENBURG, AMSTERDAM.

Author: Mr Bakker, Jan - University of Amsterdam (Presenting author)
Co-Author: Prof Gawronski, Jerzy - University of Amsterdam; City of Amsterdam Office for Monuments and Archaeology; Mr Jayasena, Ranjith - City of Amsterdam Office for Monuments and Archaeology; Ms Stolk, Marijn - University of Amsterdam; Prof Symonds, James - University of Amsterdam
Keywords: Amsterdam, Vlooienburg, Judaism
Presentation Preference: Oral

This project focuses on the evidence for material life, ethnicity, and diet in the district of Vlooienburg, Amsterdam (AD 1600-1800). It is motivated by a desire to develop an integrated archaeological methodology that enables personal possessions, tableware and food waste recovered from cesspit deposits to be linked to historically-documented households. The authors seek to refine archaeological understanding of the material expressions of identity in the form of ethnicity, status, gender, and religious beliefs in relation

to the Sephardic and Ashkenazi Jewish inhabitants and other residents of the former Amsterdam Jewish quarter, and therewith significantly, enhance contemporary public understandings of the multi-ethnic roots of Amsterdam.

The project will reappraise the post-excavation work that was undertaken in the 1980s and, crucially, extend and complete analyses of these important excavated assemblages. It will pose new research questions, use new, and much improved scientific techniques, and new forms of data analysis and presentation. The collaborative impact of the three-way public private partnership that has been established between the University of Amsterdam, the City of Amsterdam, office for Monuments and Archaeology, and the Jewish Historical Museum, will deliver a landmark project of national and international significance.

09 LIGHTING THE RUHR: THE USE OF ARTIFICIAL LIGHT AT INDUSTRIAL HERITAGE SITES IN THE RUHR

Author: Dr Orange, Hilary - Ruhr Universitat Bochum (Presenting author)
Keywords: Light, Industry, Heritage
Presentation Preference: Oral

In this paper I will present interim findings on my work on the 'Lighting the Ruhr' project, based at the Ruhr Universität Bochum. The project is examining the use of light and light based technologies at industrial heritage sites and light-art monuments in the Ruhr region. Its aim is to consider how light creates, transforms and communicates industrial heritage and whether lighting in the Ruhr represents a distinctive historically and culturally bound practice.

Since deindustrialisation (1980s-90s), industrial heritage has been central to the Ruhr's cultural, economic, social and spatial restructuring and artificial light has been widely implemented to present and promote heritage sites. Ironworks are floodlit at night for nocturnal tourism, landmark industrial structures are illuminated and light art has been installed on mine heaps in memorial to the region's industrial history.

The project questions whether an archaeological approach to light - one that considers the material traces of lighting technologies and infrastructure as well as the way that light has a transformative action on cultural materials and spaces (Bille and Sorensen 2007) - is possible and is of value.

Bille, Mikkel and Sørensen, Tim Flor, 2007, An Anthropology of Luminosity: The Agency of Light, in Journal of Material Culture, Vol 12, Issue 3, pp. 263 – 284

10 CONNECTING THE LIVING AND THE DEAD: NETWORKS IN MANX AND WELSH HISTORIC GRAVEYARDS

Author: Professor Mytum, Harold - University of Liverpool (Presenting author)
Keywords: mortuary, networks, graveyards
Presentation Preference: Oral

The relationships displayed through actions and monuments within a graveyard are numerous. This study examines the relationships between the living and the dead, between one monument and another and with the wider landscape, and different categories of the living who visit the graveyard. It is possible to investigate the powerful symbolic, textual, physical and intra-site landscape connections and avoidances. These reveal the ways in which places, monuments, the dead, and the living were all active in the 18th and 19th centuries within Manx and Welsh graveyards. Some connections are explicit, such as warning texts as if from the grave, but others were more subtle. These require careful dissection, unravelling and interpretation, allowing both relationships of which past actors were aware, and others about which they knew nothing, to be revealed.

257 MALTA: A ROADMAP TOWARDS A GLOBAL CONVENTION

Theme: 2. The Valletta Convention: the next 25 years
Author: Willems, Annemarie (Finland) - AW Heritage Consultancy; ED for Friends of ICAHM; Associate member International Scientific Committee on Archaeological Heritage Management (ICAHM)
Co-Author(s): Comer, Douglas (United States) - President, International Scientific Committee on Archaeological Heritage Management (ICAHM); Principal, Cultural Site Research and Management; Chairman, United States Committee for the International Council on Monuments and Sites (US/ICOMOS)Dunning - Thierstein, Cynthia (Switzerland) - Director, ArchaeoConcept; VP Europe and Expert Member, International Scientific Committee on Archaeological Heritage Management (ICAHM)Gowen, Margaret (Denmark) - EAA Board Member; Expert Member, International Scientific Committee on Archaeological Heritage Management (ICAHM)
Keywords: Heritage Management, Convention, Guidelines, infrastructure
Presentation Preference: Session with a key note speaker with contributions from discussants and discussion
Speaker: Leonard de Wit

The European Malta Convention defines a standard for the way in which states should manage the Archaeological Heritage (AH) and provides a frame of reference also in countries that have not ratified the convention yet.

In 1990 the Lausanne Charter, prepared by ICOMOS-ICAHM, was approved by the ICOMOS GA in Lausanne. This Charter lays down principles relating to the different aspects of AH management. At the moment ICAHM is working on Guidelines for the Management of Public Archaeological Sites. These will be suggestions made to local stakeholders, should they decide to open an archaeological site to the public.

Now 27 years after Lausanne and 25 years after Malta new economies are rising and building projects and infrastructural activities are increasing in regions where the infrastructure necessary for AH management is, understandably, embryonic. The urgent issues relating to the management of AH that Europe was facing in the 60's and 70's, as well as other issues, are now cause for concern in many other parts of the world and especially developing countries.

In this session we would like to take the opportunity to examine how the ICAHM draft Guidelines correspond with the Malta Convention and management practice in Europe. Furthermore we would like to discuss the influences the Malta convention has had outside of Europe and to explore the possibilities of taking the Malta Convention and the Lausanne Charter as a frame of reference for creating a global Convention for the Protection and Management of Archaeological sites.

01 WHY DO ARCHAEOLOGISTS NEED INTERNATIONAL LAW?

Author: Mr de Wit, Leonard - European Archaeological Council (Presenting author)
Keywords: Valletta, UNESCO
Presentation Preference: Oral

Not infrequently, demand for international law is provoked by dissatisfaction with the actions of government within a nation state. In despair, archaeologists may look to a "Big Brother" abroad who, they hope, will come to the rescue. If the plea for more or better international conventions in the sphere of archaeological heritage can be traced back to this sentiment, this plea is likely to fail.
This key note address will – in short – explain for dummies (and archaeologists) the genesis of international law. What triggers the need for international cooperation? When and why do we put our faith in legally binding conventions? And what does 'legally binding' mean in an international context? To answer these questions one needs to have an overview of existing relevant international law. In particular, it is important to get to grips with the Valletta Convention and the UNESCO World Heritage Convention, both in terms of how these conventions work and their potential use. The conclusion may be that the right approach is to make better use of what we already have, rather than investing a lot of energy in trying to produce new arrangements (with a very uncertain outcome).

02 MALTA CONVENTION: AN EVALUATION

Author: Professor Demoule, Jean-Paul - Université de Paris I Sorbonne (Presenting author)
Keywords: Malta preventive archaeology
Presentation Preference: Oral

Indisputably, the Malta or Valetta Convention was quite important to promote preventive archaeology in Europe. Nevertheless, this convention is not so precise, that it could be restrictive on the various kind of organisations of archaeology all over Europe. In some countries, like in France, commercial excavations had negative results on the quality of scientific researches. But more important, in most of parts of the world, archaeological heritage is not really protected. A new UNO convention could be one of the possible solution.

03 FROM EUROPE TO THE WORLD?

Author: Dr Young, Christopher John - Christopher Young Heritage Consultancy (Presenting author)
Keywords: Archaeology, Conventions, UNESCO
Presentation Preference: Oral

The Valletta Convention has on the whole been successful in improving the practice of archaeology within the context of development in Europe. It has been widely adopted by member countries of the Council of Europe. Some of its provisions would work elsewhere in the world but there are a number of factors to be considered. These include regional specificities as well as the range of legal instruments available. This contribution will examine the possibilities in the light of past experience with UNESCO standard --setting instruments and consider the feasibility of a world-wide convention for the protection and management of archaeology.

04 SIGNPOSTS TO PUBLIC PARTICIPATION

Author: Dr Olivier, Adrian - University College London (Presenting author)
Keywords: Management Participation
Presentation Preference: Oral

The ICAHM draft Guidelines recognise that archaeological sites are under the rightful control of stakeholders residing in the country and region in which they are located and that the Guidelines are explicitly not intended to be transformed into regulations or standards. Nevertheless, although many cultural heritage conventions recognise the importance of stakeholder participation and engagement, most of these instruments focus mainly on management and professional standards in an administrative environment that is more regulatory than participative, and that, in the context of building public awareness, is essentially a one-way process from the 'expert' to the public, with the 'public' a more-or-less passive recipient of expert values.

Truly sustainable management of archaeological sites open to the public requires proper consideration of the significance of all the values related to that site – including the non-material and non-expert values held by different 'public' communities (including, but not limited to stewards, local communities, and visitors). A combination of the Valletta Convention and the ICAHM draft Guidelines provides a sound basis for updating management approaches for archaeological sites in the 21st century, especially in a more global context in relation to regions where existing archaeological management infrastructure is limited. The challenge will be to develop a meaningful way of articulating or wrapping more conventional heritage management approaches, however well formulated, with the open, iterative, multi-disciplinary, people-oriented and essentially social concepts of cultural heritage (encapsulated in e.g. the Florence and Faro Conventions of the Council of Europe, the UNESCO Conventions on the protection and promotion of the diversity of cultural expressions, and for the safeguarding of the intangible cultural heritage, and the Council of Europe's recent Cultural Heritage Strategy for the 21ST century), and then operationalising this approach effectively so that it is embedded at all levels in management and decision-making.

258 BEYOND LOW LANDS: THE EUROPEAN RELEVANCE OF THE STUDY OF BRONZE AGE AND IRON AGE COMMUNITIES IN THE LOW COUNTRIES

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Arnoldussen, Stijn (Netherlands) - Groningen University; Stichting Metaaltijdenonderzoek Nederland
Co-Author(s): De Mulder, Guy (Belgium) - UGent, Vakgroep Archeologie; Cellule Archéologie des âges des métauxWarmenbol, Eugène (Belgium) - Faculté de Philosophie et Sc. sociales, Université Libre de Bruxelles; Cellule Archéologie des âges des métauxTheunissen, Liesbeth (Netherlands) - Cultural Heritage Agency of the Netherlands; Stichting Metaaltijdenonderzoek NederlandMüller, Axel (Netherlands) - Stichting Metaaltijdenonderzoek Nederland; ADC
Keywords: Low_Countries, Cooperation, Bronze_Age, Iron_Age, Research_collaboration
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The Bronze Age and Iron Age communities inhabiting the lowermost parts of the Northwest European fringe known as the Low Countries (e.g. The Netherlands, Belgium, lowland Germany and northwestern France), have long and rich archaeological research traditions. Particularly the wealth of wetland and upland data gathered in the contexts of professional, sometimes developer-led, research projects of the last three decades have bearing on international debates beyond the Low Countries proper. Unfortunately, integral appreciation and dissemination of the excellent research data from these regions is hampered by the absence of a journal since the demise of both Helinium and JALC and the fact that site-publications published in Dutch, Flemish, French or German by their choice of language may have limited their audience. In terms of dissemination between and beyond the Low Countries, two organisations have strived to bring together scholars interested in the Bronze Age and Iron Age: the Belgium-based "Cel Archeologie van de Metaaltijden" / "Cellule Archéologie des âges des métaux" (C.A.M.)" and the Dutch "Stichting Metaaltijdenonderzoek Nederland (SMON)". In 2017, the C.A.M celebrates its 25th birthday and the SMON its fifth. We celebrate these important achievements in organizing a joint session on the wider European relevance of the study of Bronze Age and Iron Age communities in the Low Countries. To this end, a series of speakers has been invited from both within and outside the Low Countries to reflect on the potential that the rich lowlands data set has yielded and may in future yield.

01 INTRODUCTION (BY SESSION ORGANISERS)

Author: Mr Arnoldussen, Stijn - Groningen Institute of Archaeology (Presenting author)
Keywords: prehistory, low countries
Presentation Preference: Oral

Session theme introduction, urgency and potential.
Past and Future roles of contact networks
Addressing scale
Composition of papers

02 BEFORE BREXIT: SOME REFLECTIONS ON 3RD AND 2ND MILLENNIA LINKS BETWEEN BRITAIN AND THE LOW COUNTRIES

Author: Dr. sheridan, alison - Dept. Scottish History & Archaeology, (Presenting author)
Keywords: Cross-channel links
Presentation Preference: Oral

The existence of Cross-Channel links during the Chalcolithic and Bronze Age is well documented, with Needham's concept of maritories offering a useful heuristic device for exploring the nature and social and economic dynamics of the connections. This contribution will focus on some of the outstanding questions relating to Britain's links with the Low Countries, particularly as far as the use of Beaker pottery is concerned, and will revisit the thorny question of the extent, nature and directionality of human movement during the late third and second millennia.

03 FROM "LES PAYS-BAS AVANT ET PENDANT LA DOMINATION ROMAINE" TO "LA BELGIQUE ANCIENNE": EMERGENCE OF A BRONZE AGE CONCEPT

Author: Dr Leclercq, Walter - Université libre de Bruxelles (Presenting author)
Keywords: Historiography, Belgium
Presentation Preference: Oral

During the 19th century, archaeology was not recognized as an academic matter and it was the historians who held chairs and wrote the history of Belgium. By definition, historians were used to analyse the past through textual and archives filters. Consequently, Bronze Age witnesses remained interpreted through the famous De Bello Gallico. They have thus introduced a deep and continuing ambiguity about the nature of these old discoveries and their dating. These theories imply the denial of the Bronze Age in Belgium, the "fossiles directeurs" being obviously absent.

During the second part of the 19th century, the emergence of prehistory and the large development of the archaeological societies increased the number of the artefacts linked to the Bronze Age. Henceforth, scholars and collections lay at the heart of a criss-crossing network of debate (well illustrated by the international congresses). Some scholars begin to support the idea of the existence of a Bronze Age in Belgium.

This paper will aim to define the birth of the Bronze Age in Belgium and to link the evolution of this concept with the international networks in which the Belgian scholars were involved.

04 DO LOWLANDS STAND OUT? A GREY-LITERATURE PERSPECTIVE

Author: Dr Vander Linden, Marc - University College London (Presenting author)
Keywords: GIS, development-led archaeology
Presentation Preference: Oral

Despite covering a relatively small proportion of the total surface area of North-Western Europe, archaeologists have paid extensive attention to lowlands, hereby defined as areas lying below 80m asl. In some instances, this focus merely stems from the serendipitous conjunction of research areas and local topography (e.g. Low Countries, Cambridgeshire fens). In other cases, this attention is triggered by the extraordinary preservation of archaeological remains in the associated wetlands. All in all, the archaeological record of lowlands in North-Western Europe enjoys a somewhat privileged position, in both quantitative and qualitative terms.
One can however wonder if this particular status is a mere reflection of archaeologists's interests, or a reflection of any past reality. To this purpose, we need to demonstrate that, indeed, lowlands present a significant difference regarding past use when compared to the archaeology of other areas. This presentation will seek to identify and quantity such differencesduring Later Prehistory in a GIS-based framework, taking as a starting point several recent large-scale datasets drawn from development-led archaeology. Although the practice of development-led archaeology arguably presents sampling biases of its own which need to be assessed, it provides by far the most extensive datasets to explore wide-range patterning of land use across several areas of North-Western Europe.

05 A RETROSPECTIVE VIEW ON THE LAST DECENNIA OF BRONZE AND IRON AGE ARCHAEOLOGY IN FLANDERS

Author: Prof.dr. De Mulder, Guy - Ghent University
Co-Author: Prof. dr. Bourgeois, Jean - Ghent University (Presenting author)
Keywords: Flanders, Metal Ages
Presentation Preference: Oral

At the end of the previous millennium Belgian archaeology was assigned to the regional level. So the regional governments become responsible for their archaeological legislation and organisation of the scientific research. This offered new opportunities, but also challenges as the government opted for a commercial based archaeology. Concerning the Metal Ages, during the last decennia certain research fields were on the forefront.
Aerial photography delivered new insights on archaeological and landscape features, but especially on Bronze Age barrows. Until that moment, little was known about barrow cemeteries. Nowadays more than 1100 barrows are documented in Sandy Flanders and due to preventive archaeology barrows are also appearing in the loamy regions of Flanders. The beginning of the 2nd millennium A.D. witnessed the introduction of a way to date cremated bone by using the bio-apatite in the bone and also a rise in new excavations on these sites. This technique offered opportunities to study the urnfields cemeteries and date especially the 'poor' unurned cremations. These cemeteries have a longer and more complex occupation history than assumed before.
The last decennia saw a trend toward increasing excavations of larger areas. This led to a better knowledge of house types and settlement structures and their position in the landscape. Our understanding of Middle Bronze Age houses has improved our knowledge of these societies and their use of the landscape. Numerous Iron Age settlements have been recorded, especially Early Iron Age houses. Unfortunately, The Late Bronze Age is still less documented.
The coming years offers specifically challenges in the field of quality of excavations and recording of the data in an archaeological world dominated by economic motives.

06 OSS IN PERSPECTIVE. THE DEEP HISTORY OF A PREHISTORIC AND EARLY-ROMAN PERIOD CULTURAL LANDSCAPE

Author: Drs Jansen, Richard - Leiden University (Presenting author)
Co-Author: Prof Fokkens, Harry - Leiden University
Keywords: Landscape, Deep history
Presentation Preference: Oral

Within the Low Countries the city of Oss (Nl., Noord-Brabant) has one of the longest archaeological research traditions. Generally known for its 19th century industrial development, amongst archaeologists Oss is known for it's large-scale excavations. Within a research area of app. 5 by 5 km's dozens of research projects, university, local amateur and development-led, have been carried out. During more than 40 years of research c. 100 ha have been excavated and a plurality have been surveyed with trial trenches.
Within a transitional landscape zone of sand and clay the diachronic and synchronic dynamics of this landscape with phenomena like settlement, graves, fields, cult places are researched. Based on this the deep history of a cultural landscape, especially of Bronze and Iron Age and Roman period communities will be discussed and placed in perspective.

07 NICHE RESOURCING AND KNOWLEDGES

Author: Mr Evans, Christopher - University of Cambridge; Cambridge Archaeological Unit (Presenting author)
Keywords: Marine, marshland, knowledges
Presentation Preference: Oral

Focusing on Britain's 'inland North Sea' (i.e. East Anglia's Fenland embayment), this paper will consider the differential utilisation and uptake of marine and marshland resources during the later Bronze and Iron Ages. Not only reflecting upon specialist knowledge skill-sets, issues of local identity – as well as the role of extra-regional trade and asymmetrical exchange – will be addressed.

08 COMPOSING THE DEAD PERSON IN URNFIELD GRAVES FROM THE LOW COUNTRIES

Author: Louwen, Arjan - Leiden University (Presenting author)
Keywords: Urnfield funerary practices
Presentation Preference: Oral

The transition from the Bronze age to the Iron age in the Low Countries is in fact marked with various continuing cultural traits. One of these continuing traits clearly is the habit of burying the ashes of the deceased in collective cemeteries better known as urnfields. Since urnfields occur in an area stretching from the Carpathians in the East and the Atlantic

in the West it seems evident that the Low Countries form part of a network in which cultural transmissions took place on a scale encompassing the larger part of Europe. But what ideas underlie these seemingly wide shared funerary practices? And are these practices indeed that widespread across Europe?

A case-study dealing with some 3000 cremation graves dating between 1300 and 400 BC from the Netherlands, North Belgium and West Germany shows that a multi-angle analysis of these graves is evident in our understanding of urnfield funerary practices. By combining osteological analyses, material culture studies and stratigraphical information the study revealed several reoccurring traits in the composition of urnfield graves that seem to hint at wide shared ideas about the notion of the (dead) person across the research area and most probably beyond.

This paper will present the most important methodological aspects and results of the research and aims to open up the discussion about how urnfield graves should be perceived in a broader European context.

09 EARLY IRON AGE ELITE BURIALS IN THE LOW COUNTRIES WITH CENTRAL EUROPEAN CONNECTIONS

Author: Van der Vaart-Verschoof, Sasja - Faculty of Archaeology, Leiden University (Presenting author)
Keywords: Elite burial practice
Presentation Preference: Oral

There is a cluster of elite cremation burials in the Low Countries in which situlae, weaponry, horse-gear and wagons are found. Mostly imports from Central Europe, these objects are found brought together in varying configurations in cremation burials generally known as 'Chieftain's burials' or 'Princely graves'. In terms of grave goods these burials resemble the Furstengräber of the Hallstatt Culture of Central Europe, with famous Dutch and Belgian examples being the Chieftain's grave of Oss, the wagon grave of Wijchen and the elite cemetery of Court-Saint-Etienne. These graves in the Low Countries tend to be published only in local journals and series, often in Dutch and French, making them inaccessible to many scholars (assuming they have been published at, which many have not).
This paper will present the results of an in-depth and practice-based archaeological analysis of all these elite graves and the burial practice through which they were created. Not only did this research result in a comprehensive (and English) overview of the Dutch and Belgian graves, it revealed that the elite burials of the Low Countries are embedded in the local burial practices – as reflected by the use of the cremation rite, the bending and breaking of grave goods, and the pars pro toto deposition of human remains and objects, all in accordance with the dominant local urnfield burial practice. In a few graves, however, the configuration of the grave good set, the wrapping in textiles of grave goods and the dead and the reuse of burial mounds show the influence of individuals familiar with Hallstatt Culture burial customs.

10 HOUSE LANDSCAPES IN NORTHWESTERN EUROPE IN THE LATER IRON AGE

Author: Mr Vanmoerkerke, Jan - Miinistry of culture france (Presenting author)
Keywords: House, iron age
Presentation Preference: Oral

In northwestern Europe, in the later iron age, three house landscapes are known : in Great Britain and coastal parts of the continent, the circular house is dominating, the long-house is most frequent in the northern part of Europe while France and southern Germany reveal more and more short and large rectangular houses. The low countries are in the center of this three house landscapes and we will try to develop some ideas on the significance of this opposition. We will make a comparaison of the supposed function of the three house type and we will also look at the preceding phases and try to explain the origin of this opposition.

The architecture of these houses, and particularly, the short and large rectangular house, will also be developed to show how important the visual distinction between house-types must have been for the people living along this cultural« fronteer ».

11 SO MANY HOUSES, SO LITTLE TIME: HOW RESCUE ARCHAEOLOGY CHANGES THE IMAGE OF IRON AGE SETTLEMENTS IN WESTERN LOWER SAXONY

Author: Dr Fries, Jana - Niedersächsiches Landesamt für Denkmalpflege (Presenting author)
Keywords: IronAge, LowerSaxony, Settlements
Presentation Preference: Oral

During the last 10-15 years numerous Iron Age settlements have been excavated in the west of Lower Saxony. Nearly all of these were developer led large scale excavations and took place on the sandy soils south to the marshes along the North Sea coast. They led to new insights into settlement patterns, different types of dwellings, and house plans. During the same period new questions arose about conformity and differences between coastal and inland settlements, the applicability of house types developed on Dutch sites for features found in Lower Saxony, and the function of small, short termed compared to larger, long living settlements. Even the dating of some settlements and of ceramic types haven been challenged by new radiocarbon datings.
The paper investigates the effects of rescue excavation results on our idea of Iron Age settlements in a low land region. It highlights the similarities to the settlement landscape of the neighboring Netherlands as well as the links to Westphalia and other coastal regions. Finally, the question of research strategies in the analyses of the many developer led excavations will be discussed.

12 A CRITICAL REVIEW OF IRON AGE RELIGIOUS STRUCTURES IN NORTHWEST EUROPE

Author: MA BEng De Leeuwe, Roosje - Netherlands Forensic Institute (Presenting author)
Keywords: Iron Age Religion
Presentation Preference: Oral

Iron Age religious sites have been researched for decades, especially in England, Germany and France. Most of these sites date to the later Iron Age. The excavation and extensive publications of Gournay-sur-Aronde and Ribemont-sur-Ancre in the 1980s have been determinative for how Iron Age religious structures were - and sometimes still are – perceived, since both sites have been used as comparison and means of identification for newly discovered structures across Northwest Europe. But how representative are these French sites really? In France diversity rather than commonality seems to typify Iron Age religious structures. While the German viereckschanzen seem to represent the complete

opposite in their uniform shape and size. Logically, comparing such dissimilar regional phenomena would propose challenges. However, many archaeologists leave these discrepancies out of account and continue to report cult places and sanctuaries based on the mere rectangular shape of the structure. An explicit description of the characteristics and the context that make an Iron Age site a religious one would clearly benefit future finds. Studying sites designated as religious in the centrally positioned Low Countries may provide insights, since some of the oldest rectangular structures are found in this region. This paper therefore discusses the Iron Age religious structures in the Low Countries against their Northwest European background.

259 THE ORIGINS OF MEDIEVAL VILLAGES: NEW APPROACHES AND IDEAS

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Renes, Hans (Netherlands) - Vrije Universiteit Amsterdam
Co-Author(s): Van Doesburg, Jan (Netherlands) - Cultural Heritage Agency, AmersfoortLewis, Carenza (United Kingdom) - Lincoln UniversityVerspay, Johan (Czech Republic) - University of West Bohemia
Keywords: villages, Europe, archaeology, historical geography
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Discussions on the origins of medieval villages have been going on for a long time. Archaeologists traditionally focused on deserted villages (Wüstungen), but in recent years the interest in archaeological research in existing villages is growing. However, archaeological research is here often difficult. There is some agreement on the origins of villages around the eighth and ninth centuries, but the factors behind village formation are often unclear. Although this is a feature that occurred in many parts of Europe, the explanations are often local or regional. One of the issues is the relation between the early development of villages and of open field agriculture, but also in this relation the exact chronology is still being discussed. Some of the themes that can add to discussions during the session are:

- What are villages in the Middle Ages?
- Why villages? Factors behind nucleation.
- The earliest medieval villages and the development from dynamic to more fixed settlement patterns
- The development of central functions of villages
- International comparative studies
- Prehistoric analogies.

01 TEST PIT EXCAVATION AND THE RECONSTRUCTION OF VILLAGE ORIGINS IN ENGLAND.

Author: Professor Lewis, Carenza - University of Lincoln (Presenting author)
Keywords: village, nucleation, testpit
Presentation Preference: Oral

Since 2005, a programme of excavation of more than 2,000 1m square archaeological 'test pits' has been carried out in more 60 rural settlements in eastern England. The aim of this project was to reconstruct the long-term development of currently occupied rural settlements (CORS), that is settlements of likely medieval date which did not end up as permanently deserted medieval villages (DMVs). The principle underpinning this approach was that as the majority of medieval settlements were not permanently depopulated, their development is likely to be more typical than that of DMVs, which research has shown to tend to be smaller or founded later than CORS (Lewis et al 1997). This paper will ask what the results of these excavations can tell about the origins and early development of villages in England, revisiting observations made at an earlier stage in the project (Lewis 2010) of, and consider what the potential of similar work might be elsewhere in Europe.

References:

Lewis, C. 2010. 'Exploring black holes: Recent investigations in currently occupied rural settlements in Eastern England' in N. Higham and M Ryan (eds) The Landscape Archaeology of Anglo-Saxon England (Manchester Centre for Anglo-Saxon Studies Series) (Boydell and Brewer), 83-105.

Lewis, C., Mitchell Fox, P. and Dyer, C. 1997. Village, Hamlet and Field. (Manchester University Press, reprinted 2004 Windgather Press)

02 DESCRIBING EARLY MEDIEVAL VILLAGES THROUGH THEIR POTTERY: ITALY AND SPAIN IN A COMPARATIVE APPROACH

Author: Marie Curie Fellow Grassi, Francesca - University of the Basque Country (Presenting author)
Keywords: Pottery, social complexity
Presentation Preference: Oral

In this contribute we analyse the social and political complexity in the early Middle Ages through the examination of craft production. Special attention is paid to the social context of pottery production and consumption in relation to the formation of villages and emergence of local and central powers.
Pottery is one the most eloquent marker for the analysis both of social and political complexity, offering an alternative approach to the use of written sources for the reconstruction of historical societies. We want to compare Italy (Tuscany) and Spain (Basque Country) in the order to show this great potential facing with many concrete cases of study chronologically inserted between 600 and 800 A.D.
We will show how the ceramic allows us to observe the village from the inside (e.g in its social composition) and at the same time we will bring this analysis to the outside, to understand the economic and political framework in which the village developed and observe what impact did his training in handicrafts, in the local and regional scale.

03 THE LONG ORIGINS OF MEDIEVAL VILLAGES IN NORTHERN IBERIA: A TALE FROM SOCIAL LANDSCAPE ARCHAEOLOGY

Author: Dr. Quirós-Castillo, Juan Antonio - University of the Basque Country
Co-Author: Dr. Tejerizo, Carlos - Institute of Heritage Sciences (Incipit, CSIC) (Presenting author); Dr. Rodríguez-Fernández, José - University of the Basque Country; Ms. Elorza-González de Alaiza, Lorena - Independent Researcher; Mr. Mansilla-Hortigüela, Rafael - Independent Researcher; Dr. Grau-Sologestoa, Idoia - University of the Basque Country; Ms. García-Collado, Maite-Iris - University of the Basque Country; Mr. Santeramo, Riccardo - University of the Basque Country; Dr. Hernández-Beloqui, Begoña - University of the Basque Country; Dr. Larreina-García, David - University College London; Dr. Nicosia, Cristiano - Université Libre de Bruxelles
Keywords: Peasant, Iberia, landscapes
Presentation Preference: Oral

Medieval villages have played a major role in the constitution of both social identities in existing villages in northern Iberia and academic research of the period. As in many other parts of Europe, current villages in this region have a medieval origin as a consequence of the fundamental breakdown this period meant to the social landscapes. Events like the dismantling of the Roman Empire, the Islamic invasion or the conformation of medieval kingdoms shaped and determined the constitution of these villages in a long term history. However, most part of these accounts have been made from a biased documentary perspective in which regional or local narratives were not critically confronted. Since the last decade, archaeology is playing an increasing role to tackle the issue of the origins of medieval villages in northern Iberia. In this paper, we will present preliminary results of an ongoing research project whose main aim is to interpret from a social and dialectical standpoint the configuration of medieval landscapes in a specific region of northern Iberia called 'Rioja Alavesa'. Long term excavations both in an existing village, Labastida, and in a deserted village, Torrentejo, were approached from a social landscape archaeology which integrated isolated archaeological elements into a holistic paradigm including not only the domestic or funerary spaces but also the agricultural spaces through the study of terraces. The long term approach of this project enables us both to understand the implication of past societies in landscape construction and to understand the social complexity of medieval local communities, highlighting its great potential for other case studies throughout the Iberian Peninsula.

04 IN SEARCH OF MEDIEVAL VILLAGE FORMATION IN THE NETHERLANDS. AN ASSESSMENT OF 10 YEARS OF DEVELOPMENT-LED EXCAVATIONS.

Author: Drs. Verspay, Johan - University of West Bohemia; University of Amsterdam (Presenting author)
Keywords: medieval village settlement
Presentation Preference: Oral

The implementation of the Valletta Treaty in Dutch law in 2007 led to a boom in archaeological excavations. Although this produced a wealth of information, synthesis of this data into new knowledge of our past remained behind. In order to address this issue the National Heritage Agency of the Netherlands (RCE) started the Malta Harvest programme in which this data was to be used to address major themes from the Dutch National Archaeological Research Agenda (NOaA). One of these themes was 'Village Formation in the Middle Ages.'
After careful assessment of nearly 200 sites it became apparent that the data was insufficient for a stand-alone synthesis. Despite the large number relevant excavations, the sites were dispersed and mainly focused on the level of the house and toft. Moreover the data is heavily biased towards deserted settlements. An effort to use the data instead to test existing settlement models fell short too because of the abstract nature of these models.
A solution to this problem was found in historical geography. This provided a framework in which site-based archaeological data could contribute to the overall image of the settlement and its development, which in turn could be tested against the regional models. However, cases for which sufficient data is available on each level are scarce. Yet, an indepth analysis of four of these cases illustrates that this combination can provide insight in the formation and development of a village. Interestingly, the processes behind village formation appear to be fairly common at a general level. How these processes turn out at the local level, however, very much depends on local factors and human agency. As a result, despite these common processes, each village underwent its own development. Only through an understanding of these individual villages it is possible to reconstruct the regional dynamics.

05 THE COMPLEX ORIGINS OF VILLAGES AND OPEN FIELDS

Author: Renes, Hans - Utrecht University (Presenting author)
Keywords: villages, fields, Europe
Presentation Preference: Oral

Villages are group settlements, with a size between hamlets and towns and with some central functions. The origins of villages are diverse and include political, economic and social factors. One of the topics that has been discussed for a long time is the relation between the emergence of large, concentrated villages and of extensive open fields with their complex field-patterns. Both seem to have their origins around the 9th and 10th centuries and developed further during the Middle Ages and the Early-Modern Period. In open fields in different countries, traces have been found of deserted medieval hamlets that seem to point to processes of concentration of the population in larger villages. However, the explaining factors but also the exact chronology are still under discussion. In this paper, the evidence from different regions will be presented in a comparative perspective.

06 SPATIAL ANALYSIS OF MEDIEVAL VILLAGE AGRICULTURAL IMPACT – WHAT IT CAN REVEAL

Author: Horak, Jan - Czech University of Life Sciences, Dept. of Ecology; Charles University, Institute of Archaeology (Presenting author)
Co-Author: Janovský, Martin - Charles University, Institute of Archaeology; Klír, Tomáš - Charles University, Institute of Archaeology; Šmejda, Ladislav - Czech University of Life Sciences, Dept. of Ecology; Legut-Pintal, Maria - Wrocław University of Technology, Institute of History of Architecture Art and technology
Keywords: fields, soils, geochemistry
Presentation Preference: Oral

There have been performed several researches of abandoned medieval vilages in Bohemia and Silesia in previous years: Spindelbach (Ore Mountains, North-Western Bohemia), Hol (near Prague, Central Bohemia), Lovětín and Regenholz (near Třešť, Czech-Moravian Upland) and Goschwitz (near Wroclaw, Poland). These researches were focused on geochemical analyses of medieval fields. The results revealed many presumable findings about medieval agricultural impact, like which elements can record it, what can we obtain from Phosphorus analysis and so on. But the research design was planned to be used also as a tool to obtain the information about peoples choices, economic strategies and in second plan, about their knowledge, experience and perception of the landscape. Since we have found more questions than answers, we would like to discuss it to obtain new inspiration and to share the experience with other archaeologists aiming on the villages.
This output was created within the project "New insights on a functional structure of abandoned villages field systems and on relationship between human activities and environment by way of pedochemical methods funded by Charles University Grant Agency (project No. 307415) and within the project Kulturní techniky: materialita, medialita a

imaginace, subproject Středověká ves a její přírodní prostředí. Mezioborový výzkum zaniklých vsí v zázemí Prahy solved at Charles University from the Specific university research in 2016 and within the project Landscape of Medieval Prague funded by Czech Science Foundation, project No. 16-20763S.

07 THE ORIGINS OF MEDIEVAL VILLAGES: NEW APPROACHES AND IDEAS THE ROLE OF WORLDY AND ECCESIASTICAL ELITES

Author: Drs Doesburg, Jan - Cultural Heritage Agency of the Netherlands (Presenting author)
Keywords: villageformation, elites, manors
Presentation Preference: Oral

Recently several studies have been published in the Netherlands focusing on the theme of the origins of medieval villages and processes leading to village formation in that period. In most of these studies horizontal relations between farmers are stressed and their role as driving forces behind village formation. The involvement of worldly and ecclesiastical elites is seen as of lesser importance and in some cases even marginalized. This is surprising as in several other parts in Europe elite groups seem to have plaid a vital role in village formation, the lay out and development of villages. This leads to the question if the driving forces behind village formation in the Middle Ages in the Netherlands really differ from those in other parts of Europe?
This contribution wants to address this question by looking at the process of village formation in the Central River Area of the Netherlands. In this area we see in the ninth to eleventh century villages developing in the direct vicinity of landed estates owned by the aristocracy and ecclesiastical institutions and officials. Church, manor and often a village green form the core of these villages surrounded by a farmsteads, a mill, arable fields and meadows . In the Late Medieval period most manors were dismantled. Several were succeeded by a brick castle

08 THE ORIGIN OF THE VILLAGES CALLED "TYNEC" – RESETTLEMENT AND A NEW BEGINNING

Author: MA Siłakowska, Marta - University of West Bohemia in Pilsen (Presenting author)
Keywords: Resettlement, Central Europe
Presentation Preference: Oral

Europe in the High Middle Ages was changing rapidly. Cities were rising as centres of craft and trade while most of the people still lived in rural communities. At the same time appears an intensified population growth and increased migration of the people. It is connected not only with searching for new opportunities, but also with conflicts.

One of the main causes of the settlement relocation from one to another country was resettlement of captives. The reason for this kind of activity was to increase the economic potential of particular countries. Such practices had, among others, Polish and Czech rulers. During the conquests local people were often abducted and resettled in neighbour country.

Resettled population was sometimes dispersed, but the common procedure was to settle them in a remote and unsettled location. Entire villages retained their original name or received a new one related to the origin of the settlers.
We may often find settlements called "Tynec" in the immediate vicinity of those villages – there are several dozens of such places on the territories of today's Poland and Czech Republic.

The main aim of the paper is to investigate the history of settlements named "Tynec" and determine their function in relation to the nearby resettled villages. We may try to describe their rise and fall and consider on their role in the region.

260 THE POWER OF POPULATIONS: INTEGRATING BIOARCHAEOLOGICAL AND HISTORICAL METHODS FOR THE ASSESSMENT OF OUR MEDIEVAL PAST.

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Altena, Eveline (Netherlands) - Leiden University Medical Center
Co-Author(s): Inskip, Sarah (United Kingdom) - Cambridge University
Keywords: Middle ages, Bioarchaeology,History, Populations
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

MERC
Medieval Europe Research Community

Researching the biological characteristics of individuals provides key information for understanding the functioning of past populations. While physical anthropological and palaeopathological methods have long been used to reconstruct individual biological profiles and characterise past populations, DNA and isotope analyses have also emerged as valuable tools in bioarchaeology. As each method contributes different information, it has become increasingly apparent that powerful insights into demography, migration and mobility, socio-economic position, urbanization and health can be gained by combining results from multiple approaches.
The first aim of this session is to evaluate how both the application of the 'new' methods, like DNA and isotope analysis, but also the integration of different methods on medieval populations, have contributed to and/or changed our perspective on medieval populations. By addressing research on populations from all over Europe and the entire period we also hope to gain an insight in temporal development and spatial variation for European populations.
The second session aim is to investigate how we can relate this new data to existing historical frameworks of medieval Europe to produce a better picture of the past. Cooperation in these two disciplines is crucial in our opinion, as we think they can strongly benefit from each other. While bioarchaeological information itself is revealing, it can be hard to interpret data without the relevant historical context. Conversely, due to lack of specific data, population related information is sometimes estimated in historical research.
We therefore invite papers on both bioarchaeology, preferably multimethod, and on historical research on (post)medieval populations.

01 POVEGLIANO VERONESE - A POST CLASSICAL NECROPOLIS FROM THE NORTHERN ITALY (VI-VIII CENTURIES AD)

Author: PhD Student Micarelli, Ileana - Dipartimento di Scienze dell'Antichità, Sapienza Università di Roma, Piazzale Aldo Moro, 5, 00185 Roma, Italy (Presenting author)
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Keywords: Longobards, strontium, osteology
Presentation Preference: Oral

The Longobard necropolis of Povegliano Veronese, discovered in 1985, is located in the Veneto region of Northern Italy. It is located near the "Via Postumia", one of the main ancient Roman roads of Northern Italy. The necropolis was excavated in two field seasons (1985-86 and 1992-93). As a result, 162
Longobard burials were recovered. Based on the archaeological evidence the necropolis was dated from
the late VI century to the early VIII century AD. A critical defining cultural aspect
to this necropolis comes from the Northern portion of the site, were a headless horse with two
greyhounds were found. This specific form of animal offering is typically found in Longobard
necropolises. At first, it was essential investigate the biological profile of the population, with the aim to understand the population mortality profile and paleodemographic data. Further, the residential mobility of the population is the focus of our research. Longobards were a population "on the move" and in a pilot study, through the application of strontium isotope analysis (87Sr/86Sr) on 25 individuals from the site, interesting data emerged. This research was fundamental to understand the complexity of mobility in post-classical studies, and it appears crucial to increase our understanding of historical sources. Finally, ethno-anthropological data were used to identify possible activities carried out by the individuals to increase information about the archaeology of production in the Middle Ages, stimulating a methodology based on the dialogue between the archaeological and the biological investigation

02 INTRODUCTION TO THE SESSION 'THE POWER OF POPULATIONS: INTEGRATING BIOARCHAEOLOGICAL AND HISTORICAL METHODS FOR THE ASSESSMENT OF OUR MEDIEVAL PAST'.

Author: Altena, Eveline - Leiden University Medical Center (Presenting author)
Co-Author: Inskip, Sarah - Cambridge University
Keywords: introduction
Presentation Preference: Oral

Over the past few decades significant advancements in scientific and statistical methodologies have had a dramatic impact in archaeology. As the papers in this session will show, the application of such techniques in the analysis of large skeletal populations can provide researchers from multiple disciplines with unprecedented glimpses in to the lives of past populations. In this introductory session the aims of the session are set out as well as what we hope to gain from it.
The presentations will contain data that is based on highly specialized and science-based bioarchaeological methods, which may be (partly) unfamiliar to others, but some basic understanding of these methods is crucial in being able to both understand and critically interpret results and conclusions. We will therefore provide the audience with a technical 'crash course' on the methods that will be discussed by the different presenters, so they can focus more on the results instead of on technical details during their presentations.

03 LEPROSY AND TUBERCULOSIS IN MEDIEVAL PORTUGAL: AN OVERVIEW OF BIOARCHAEOLOGICAL AND HISTORICAL EVIDENCE

Author: Matos, Vitor - University of Coimbra, Research Centre for Anthropology and Health, Dep. Life Sciences, Portugal (Presenting author)
Keywords: Paleopathology, Bioarchaeology, Portugal
Presentation Preference: Oral

Leprosy and tuberculosis (TB) are mycobacterial diseases with remarkable social and epidemiological impact both in past and present human populations. During the last decades, relevant improvements were made on the paleopathological diagnosis of these chronic infections and, consequently, cases detected in archaeological material from different historical periods increased considerably worldwide. This paper will present a systematic review of skeletal evidence of leprosy and TB in medieval Portugal and, by combining bioarchaeological and historical evidence, will provide a broader picture of their historical path and coevolution. The paleopathological record reveals that the oldest possible cases of TB and leprosy in the Portuguese territory date back to the 4th-5th centuries AD. The number of cases augmented considerably after the 12th century, a trend also seen in other European countries, probably due to increased population density, mobility, and social inequalities. While TB is poorly documented on the Portuguese historical record until the 19th century, the poor living conditions and social exclusion of leprosy patients, including their isolation in leprosaria, is well documented historically.

04 IN SICKNESS AND IN HEALTH: APPLYING BIOARCHAEOLOGICAL AND HISTORICAL METHODS TO THE MEDIEVAL HOSPITAL OF ST JAMES, THORNTON ABBEY, ENGLAND.

Author: Miss Hook, Emma - The University of Sheffield (Presenting author)
Keywords: Bioarchaeology, Demographic, Hospital
Presentation Preference: Oral

This paper will show that the combined analysis of bioarchaeology, archaeological context and historical frameworks will produce a comprehensive and nuanced understanding of the hospital of St James and its population. In 2012 the hospital of St James at Thornton Abbey was discovered by a team of archaeologists from the University of Sheffield. The archaeological remains from Thornton provide the opportunity to investigate a later medieval hospital and its cemetery population.

This paper draws on my doctoral research into the human remains from the medieval hospital, I will present preliminary analysis of the Thornton Abbey population illustrating how this data can be used to gain a broader picture of health care and burial practices in the later medieval hospital. The techniques employed in this investigation include osteological practices used to determine population demographics and the presence of pathological markers indicative of disease, which I will discuss in further detail. In addition, I will discuss how the archaeological context was in this case of greater use than isotope analysis, and how the application of DNA analysis to establish familial relations

could further our understanding of burial practices. As well as demonstrating how 3D modelling has been utilised to document burial conditions and demonstrate what we were presented with in the field.

The work presented in this paper combines work on a newly discovered medieval assemblage from Britain with techniques that have a wider scope for aiding our understanding of population demographics and disease profiles.

05 FRACTURE DISTRIBUTION PATTERNS AS SOCIO-ECONOMIC MARKERS? AN EXAMPLE FROM MEDIEVAL ENGLAND

Author: Girotto, Chiara G. M. - Goethe University Frankfurt (Presenting author)
Co-Author: Dr Gowland, Rebecca L. - Durham University; Dr Jakob, Tina - Durham University
Keywords: status, fractures, patterns
Presentation Preference: Poster

Social status is one of the strongest determinants of health today, but few studies have examined the relationship between status and pathology in past populations. In this study 7319 adult individuals from 60 sites dating from the 10th – 16th centuries in England were examined with the aim of assessing correlations between blunt force skeletal trauma and socio-economic status. An overall fracture frequency of 0.27 % (2501/927730) was observed based on true prevalence rates. Significant sex and age differences in fracture patterns were observed.
As expected, there were also strong differences in the fracture patterns of individuals excavated from mass graves of violent origin and those buried at hospital cemeteries, when compared to normative cemetery types (urban/rural, intramural church and epidemic mass graves). Overall the fracture patterns did not display any features that would allow groups of individuals to be assigned to a particular socio-economic status or occupational activity. Performed identities are, however, intersectional and age- and sex-related patterns in trauma were identified that may relate to gendered activities over the life course. It was concluded that fracture distribution patterns should not be used to determine socio-economic status or subsistence economy in medieval England as they are more likely to approximate the age and sex ratio of the sample.

06 DOES BEING WEALTHY MEAN YOU ARE HEALTHY? - AN INTERDISCIPLINARY BIOARCHAEOLOGICAL STUDY ON POST-MEDIEVAL CRYPTS FROM GERMANY

Author: Alterauge, Amelie - University of Bern, Institute of Forensic Medicine, Department of Physical Anthropology; University of Heidelberg, Institute of Pre- and Protohistory and Near Eastern Archaeology (Presenting author)
Co-Author: Lösch, Sandra - University of Bern, Institute of Forensic Medicine, Department of Physical Anthropology
Keywords: crypt, bioarchaeology, mummies
Presentation Preference: Oral

Church vaults were used as burial places for the nobility and bourgeoisie between the 16th and the 19th century AD in Central Europe. Due to environmental conditions, the inventory of a crypt is often preserved, including coffins, fabrics, botanical and human remains. This material represents a unique opportunity to investigate the funeral customs as well as the living conditions and health of specific social groups during the post-medieval period.
In this study, five crypts from Germany dating to the 17th to 19th century AD were investigated: St. Nicolaus Church in Nedlitz, St. Catherine's Church in Salzwedel, Monastery Church in Riesa, Sommersdorf Castle, and the Church of the Assumption in Illereichen. In total, 65 coffins containing human remains in different states of preservation were analysed.
The aim of the study is to identify the inhumations by combining archaeological, historical, molecular and anthropological investigations. Therefore, archive records were studied to identify the name, ancestry, title, occupation, date of birth and death, and burial site of the entombed individuals. The coffins were visually inspected and dated by typo-chronological comparisons, and the mummified and scattered skeletal remains were subjected to a physical anthropological investigation. A detailed scientific examination, including conservation, molecular analyses, X-ray and/or computed tomography (CT), was performed in selected cases. Being confronted with the strengths and limitations of each methodological approach, probable identification was achieved.
The biological characteristics of this sample are then compared to contemporary lower-class populations, especially focusing on parameters such as health, nutrition and body height to evaluate the impact of socio-economic status on a group´s well-being.

07 MULTIDISCIPLINARY APPROACH FOR THE POPULATION STUDY FROM THE LATE ANTIQUE TO THE EARLY MEDIEVAL PERIOD IN BERGAMO AREA (ITALY)

Author: Dr. Marinato, Maurizio - Università di Padova (Presenting author)
Co-Author: Dr. Hakenbeck, Susanne - University of Cambridge; Dr. Chavarria, Alexandra - Università di Padova; Dr. O'Connell, Tamsin - University of Cambridge
Keywords: medieval, Italy, isotopes
Presentation Preference: Oral

The aim of this work is to investigate the characteristics of the population in northern Italy from the Late Antique to the Early Medieval period, focusing on the themes of nutrition and individuals' migration. This research is based on a multidisciplinary methodology which comprehends archaeology (focused on topography of the cemeteries and grave-goods), bioarchaeology (taphonomy, physical anthropology and paleopathology) and stable isotopes analyses performed on enamel, dentine and bone collagen using Carbon, Nitrogen and Oxygen isotopes.
The case of the province of Bergamo offers an excellent opportunity to investigate the Late Antique and Early Medieval population. In this area 3 cemeteries were selected: Covo loc. Bellinzana dated to the Late Antique period (4th-6th c.); Caravaggio loc. Masano and Fara Olivana dated to the Early Middle Ages (6th-8th c.). The anthropological data provided information about the composition of the groups, all subject to a particularly heavy workload (even if in the burials of the early medieval cemeteries some important features were not observable due to the poor conservation of the bones). The stable isotopes data shows a change in diet from the Late Antique to the Early Medieval period, probably a consequence of different economic systems. Furthermore, a case from Caravaggio demonstrates that integrating different sources of information (isotopic analyses, anthropology and archaeological data) can provide evidence of migration.

08 BEYOND THE NARRATIVE – A COMPREHENSIVE, BIOARCHAEOLOGICAL PERSPECTIVE ON LIFE AND LIVING CONDITIONS IN THE EASTERN ALPS, 5-6TH CENTURY AD

Author: Dr Binder, Michaela - Austrian Archaeological Institute, Austrian Academy of Sciences (Presenting author)
Keywords: Bioarchaeology, Early Medieval
Presentation Preference: Oral

Bioarchaeological research into the Early Medieval Period has largely focused on aspects of ethnicity and migration, reflecting traditional research themes and trends in archaeology and historiography. This new multi-disciplinary research project aims to investigate and compare life and living conditions in two contemporary, neighbouring, but ethnically distinctive settlements at the Hemmaberg and in Globasnitz in Southern Austria (5th/6th century AD). Based on systematic palaeopathological analysis assessing parameters of mortality and morbidity, nutrition, physical activity and trauma in 640 skeletons excavated at these sites, in combination with biomolecular data, the results are contextualised within their environmental, cultural, socio-economic and historical background. This approach aims to move beyond classic narratives of population movement, conflict and warfare in order to reconstruct the lived experience of the people during this decisive period of European history and add a new perspective, which is essential to any attempts to meaningfully reconstruct the historical processes shaping Early Medieval Europe.

09 CONFRONTING GRAVEYARD BIAS: A MULTI CEMETERY APPROACH TO RECONSTRUCTING MEDIEVAL LIFE

Author: Dr Inskip, Sarah - University of Cambridge (Presenting author)
Co-Author: Professor Robb, John - University of Cambridge; Mr Cessford, Craig - University of Cambridge; Cambridge Archaeological Unit; Dr Dittmar, Jenna - University of Cambridge; Dr Scheib, Freddi - University of Cambridge; Mr Mulder, Bram - University of Cambridge; Miss Rose, Alice - University of Cambridge; Dr O'Connell, Tamsin - University of Cambridge; Dr Kivisild, Toomas - University of Cambridge; Dr Mitchell, Piers - University of Cambridge; Dr Stock, Jay - University of Cambridge; Dr Hakenbeck, Susanne - University of Cambridge
Keywords: Cambridge, Bioarchaeology, Multidisciplinary
Presentation Preference: Oral

Over the past few decades multiple large European medieval cemeteries have been identified and excavated. Combined osteological and scientific analysis of the skeletons has enhanced our understandings of daily life in these medieval places. However, one common criticism exists which surrounds how representative these cemeteries, especially those dedicated to specific individuals (e.g. religious houses and hospitals), are of the communities they served. In fact, most cities and large communities will have had multiple cemeteries in use simultaneously, and each of these would have had some kind of exclusionary criteria, including parish cemeteries which are often regarded as the most representative. As such, it can be argued that no cemetery sample can ever be fully representative, and the conclusions drawn from them cannot be seen to reflect the population as a whole. While this appears problematic, it need not be. This problem actually stems from our current tendency to view communities as being a singular entity, yet in reality they are not usually made up of one homogeneous mass. They are in fact made up of multiple groups, and the relationships that exist both between them and with surrounding communities. Thus any successful analysis and narrative of a place, and what it meant to live there, actually requires an understanding of the different groups that existed and how they relate to each other. As such, when attempting to assess past populations of larger and complex communities, such as those that existed in the medieval period, it is perhaps far more fruitful to assess multiple and different types of cemeteries and to analyse osteological and scientific data both separately and in comparison. The aim of this talk, which includes a case study of medieval Cambridge, is to demonstrate how this approach can significantly enhance our understanding of past populations.

10 THE MAQBARA OF PAMPLONA (NAVARRA, SPAIN, 8TH CENTURY AD): HUMAN MOBILITY AND MTDNA ANALYSIS

Author: Dr. Díaz-Zorita Bonilla, Marta - Tübingen Universität (Presenting author)
Co-Author: Dr. De Miguel Ibáñez, María Paz - University of Alicante; Dr. Prevedorou, Eleanna - Arizona State University; Dr. Fontecha, Lara - University of the Basque Country; Dr. Knudson, Kelly - Arizona State University; Dr. Izagirre Arribalzaga, Neskuts - University of the Basque Country; Dr. Romero Rameta, Alejandro - University of Alicante; Prof. Buikstra, Jane - Arizona State University; Prof. De la Rúa, Concepción - University of the Basque Country
Keywords: maqbara, strontium, mtDNA
Presentation Preference: Oral

The maqbara of Pamplona is the oldest Islamic necropolis in the Iberian peninsula (715-770 AD). The archaeological excavation of 172 graves identified a total of 177 individuals of both sexes and all age ranges with a 50% representation of subadults. Within the findings, intentional dental modifications have been observed in 12 adults, mostly female (48%) respect to the male (12%) individuals. To date, this cultural practice is not documented in Spain until the Late Medieval period and always associated to an African origin population.
Results of the isotopic analysis of strontium (87Sr/86Sr) revealed that two of those female individuals, one of them showing intentional dental modifications (PLC 159) and another with lack of evidence (PLC 28) were non local individuals. The mtDNA analysis offered complementary evidences. Individual PLC 159 is identified as HV0 haplogroup which is more frequently represented in Europe rather than in North Africa. This result is compatible with the isotopic analyses as regards the non local origin of the individual. However, individual PLC 28 has been identified as an Haplogroup H1b which is more frequently observed in Europe (42%) and around 1% in Africa, therefore this woman is probably local but an African origin cannot be excluded.
The combination of different biochemical methods is of great interest because they offered consistent results suggesting the non local origin of individual PLC 159. Moreover, the individual PLC 28, although the haplogroup presents a lower frequency in Northern Africa, a non local origin cannot be excluded.
Our findings are of great significance because they represent the first generation of African origin women confirming that the first incoming Muslim population during the 8th century BC were composed of family groups and not only by military men.

11 A STABLE STORY: INSIGHTS INTO THE DEVELOPMENT OF A (POST)MEDIEVAL POPULATION IN THE NETHERLANDS

Author: Altena, Eveline - Leiden University Medical Center (Presenting author)
Co-Author: Kootker, Lisette - Vrije Universiteit Amsterdam; Panhuysen, Raphael - Anthro.nl; University of Amsterdam; Smeding, Risha - Leiden University Medical Center; De Knijff, Peter - Leiden University Medical Center
Keywords: Populations, bioarchaeology, Netherlands
Presentation Preference: Oral

Recent excavations of the historic cemetery of the eastern Dutch town of Oldenzaal produced 2750 skeletons. The cemetery has been in use from ~700 until 1829 AD and had a regional function. An extensive population study was planned for which 200 skeletons were selected in such a way that they represent the entire timespan and as much of the excavated burial area as possible.
Research questions concerned the themes demography, socio-economic position, health, diet and migration and mobility. Since the cemetery had been in use for over 1000 years, we were also able to focus on chronological developments. To answer the research questions the following methods were applied on all 200 selected skeletons: physical anthropology, paleopathology, DNA analysis (autosomal and Y-chromosomal STR's and mitochondrial and Y-chromosomal haplogroups) and isotope analysis (strontium, oxygen, carbon and nitrogen).
In brief, the results point towards a stable population. Temporal changes that are observed are mainly related to changes in life conditions and daily activities over time instead of changes in the population itself. Both the genetic and isotope data show indications for incidental long distance migration in combination with substantial regional mobility, despite the fact that Oldenzaal was well connected to the outer world and a member of the international Hanseatic League. We also observed several indications for a relatively low socio-economic position of the studied population, but relatively little differences between females and males, based on demographic and health indicators. The amount of non-adults is disproportionally low though, especially for the post-medieval period, possibly indicating deviating funerary practices for children. Also remarkable is the near lack of fish in the diet of the analyzed population.

12 COMBINING DISCIPLINES TO BETTER UNDERSTAND THE POPULATION IN MEDIEVAL TRONDHEIM, NORWAY.

Author: Dr Suppersberger Hamre, Stian - University of Bergen (Presenting author)
Keywords: Medieval, Population, Skeletons
Presentation Preference: Oral

Skeletal material is an excellent starting point for investigating, and developing a better understanding of, past populations. Information gathered through traditional anthropological methods is, however, unsatisfactory, and even the inclusion of modern methodologies like isotope analyses and genetics leave significant holes in the picture of the studied populations. A full understanding of past populations is probably not possible, but the only way to really broaden our knowledge is to combine information from as many different disciplines as possible. Concentrating on thematic research and being less contained within one's own discipline make it possible to get closer to the people of the past.
Recent investigations based on the skeletal remains from Trondheim, Norway, have tried to make use of this broad multidisciplinary approach to improve the understanding of immigration, mobility, and population composition in this town on the outskirts of medieval Europe. The combination of anthropological examinations, stable oxygen isotope analyses, genetic information, facial reconstructions, archaeological, and historical data have provided new information about the medieval population in Trondheim. The emerging picture is one of a heterogenous population, diverse in most respects, and with clear similarities to modern day urban populations.
This paper will present some of the methodology and results of the above-mentioned investigations.

261 STONE IS THE STORYTELLER - THE MATERIALITY OF STONE THROUGH TIME (AND MIND)?

Theme: 6. Interpreting the archaeological record
Author: Foreman, Penelope (United Kingdom) - Bournemouth University
Co-Author(s): Whitaker, Katy (United Kingdom) - University of ReadingSciuto, Claudia (Italy) - Umeå universitet
Keywords: materiality, stone, lithics, storytelling, trans-disciplinary
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Stone is the media of much of archaeology. It persists and survives where much of the other apparatus of life - cloth, food, bodies, stories and songs - decay and become lost. For this reason it forms not only a large part of the archaeological record, but also forms the props and settings of many of the stories archaeologists tell about the past. But should the stone tell other stories - how do archaeologists interpret and present the agency of the stones themselves?

We intend to broaden our enquiry, reaching beyond the confines of prehistory's preoccupation with stone into historical periods and the present day. Our interests extend to the material agency of stone in contexts that could be characterised as the small, personal, and intimate, such as jewellery; and those that could be characterised as communal, public, and topographic, such as architecture. Your stone might be raw and not modified by processes such as carving, knapping, cutting - we are interested in the material agency of stone in all its forms.

This session will hear stories from stones, not just of prehistory but at all stages of their entanglement in human history. We invite contributions from archaeologists, geologists and geographers, architectural and art historians, artists, curators, and anyone working with, interpreting, and presenting stony materials. We are especially interested in trans-disciplinary, innovative, and creative approaches.

01 ONCE UPON A TIME, SARSEN STONES SPOKE. HUSH! DO YOU WANT TO HEAR THEM?

Author: Miss Whitaker, Katy - University of Reading (Presenting author)
Keywords: sarsen-stone, prehistory, folklore
Presentation Preference: Oral

Once upon a time, sarsen stones had a voice. A long time ago, sarsen stones were alive. But they have become silent stones, dead stones. Sarsens used to be able to change things, to change people, to make things happen. They have become a mere cypher; a stand-in for labour, a stand-in for ancestors: or a prop; holding up things like roofs, lichens, and gates. It is time to give sarsens back their voice, to re-animate them.

In the earliest enquiries into southern Britain's sarsens, the stones are full of vigour and life. They have names, identities, character: they breed, they grow, they move, they do things. But sarsens have been threatened, and damaged. Between the 1850s and 1930s in north Wiltshire (UK) there was a sarsen genocide. This prompted an intervention. Sarsens needed protection, so they were cared for because of their character, their presence.

This led to them becoming boulders of sand frozen in time by silica cement. They became mineral resources to be exploited, a nuisance to be dealt with. They were merely a convenient rock; as building components in archaeological monuments they were nothing more than scaffolding for rites and rituals. A local stone of no special merit, not worthy of the love, the fear, the respect they once garnered. They were silenced. Worse, they became dead stones.

But sarsens live and breathe. They sweat. They are fought over. They still attract visitors. They are ecosystems that are part of a living, growing, changing world. They should get their voices back. They should be heard. Listen!

02 THE MATERIALITY OF JAPANESE JADEITE THROUGH THE AGES

Author: Dr Bausch, Ilona - University of Tokyo (Presenting author)
Keywords: stone materiality identity
Presentation Preference: Oral

Due to its special characteristics, jade always has been valued worldwide. Although little-known outside Japan, arguably no mineral has played as influential a role in rock-loving Japanese culture as jadeite (hisui). This paper deals with the materiality of this jadeite; drawing on archaeological, historical and ethnographic data, it aims to illustrate how the social value, symbolism and usage of jadeite changed over time in tandem with transformative socio-cultural developments, and how jadeite still plays an important role in Japanese culture and identity today.
Prehistoric hunter-gatherers discovered its source area 6000 years ago in a remote area along the Japan Sea Coast, learning to transform this hard material into tools and objects. Its use slowly shifted, from communal amulets imbued with magical powers to increasingly important status markers. Curved "magatama" beads during the state formation period (AD 3rd to 7th C) circulated in elite-controlled exchange networks spanning Japan and Korea, found almost exclusively in royal mounded tomb burials. The importance of jadeite during this period is reflected in Shinto mythology.
After the introduction of Buddhism in the 8th century, jadeite curved beads were donated to decorate sacred statues at Buddhist temples. Knowledge of the original source area was lost; scholars assumed that jadeite originated from China. Farmers handed over accidental finds to temples as divine relics from the Age of the Gods, while wealthy 18th and 19th century collectors valued jadeite beads as collectible antiquities.
In the mid-20th century, archaeologists rediscovered the jadeite source area (now protected as Itoigawa UNESCO Global Geopark), turning this impoverished rural area into a popular tourist destination. Jadeite rock outcrops and unworked pebbles now have also become valued in their own right. Moreover, the concept of jadeite-as-sacred-material still plays a significant role in popular culture.

03 HEALING POWERS AND LOVE POTIONS - THE RE-USE OF STONE AGE ARTEFACTS AS MAGICAL OBJECTS

Author: Kunnas-Pusa, Liisa - University of Helsinki (Presenting author)
Keywords: Object biography, folklore
Presentation Preference: Oral

Stone is an intriguing material: lasting, hard, cool to touch, beautiful. Especially Stone Age polished stone artefacts catch the eye of anyone who happens to unearth them. They often still have their polished smooth surface and sharpened edges when found after millennia. Even though the archaeological concept of Stone Age as the oldest phase of the human past was only accepted to the mainstream of both science and public opinion during the 19th century, the stone tools have always been collected. Since it was not known that the interesting-looking stones were man-made tools, people envisioned a supernatural origin for them. The folklore of stone artefacts as "thunderbolts" and their re-use for magic is widespread, known in almost every culture. It most likely emerged as soon as the use of stone as a raw material before metals had faded from the collective memory of people, and prevailed in many places until the beginning of the 20th century.

As objects of supernatural origin, the thunderbolts were thought to have a wide variety of magical powers. They were used as protective amulets against lightning, fire and witch-craft as well as for example in healing magic. In my paper I am going to present superstitions associated with thunderbolts in Finland, documented during the late 19th century by collectors of Stone Age artefacts for museums. Ritual practices have had their impact on the artefacts. There are often pentagrams etched on the surface and marks of detaching pieces of stone for magical purposes. The second life of Stone Age tools as magical objects is an example of a different kind of story a stone artefact can tell.

04 INDIVIDUALISATION OR COMMON GOOD? STONES AS MATERIAL EXPRESSION OF FEMALE RELIGIOUSNESS IN ROMAN DALMATIA

Author: Ms Mech, Anna - University of Warsaw (Presenting author)
Keywords: stone, Roman, religion
Presentation Preference: Oral

In Roman religion stone had two contradictory features. On one hand it expressed individuality of people who commissioned its design. The stones with inscriptions were modified in various ways by carving and cutting, both letters and ornaments. The monuments with inscriptions could be also engraved in different types of stone, depending on

the financial means of a dedicant. On the other hand, stones with inscriptions were placed in public places, especially in temples and sanctuaries, so they could be characterised as communal or as objects for admiration or inspiration.

The aim of this paper is to present the importance of use of stone in Roman religious practices using the case study of votive inscriptions set up by women in the province Dalmatia. It was not only the medium of religious dedications but also had a symbolic role in Roman society. Votive inscriptions could express individuality of dedicants, religiousness but also adherence to the Roman culture. The stones are also one of the few categories of finds which allow any glimpse into the participation of women in Roman religion.

05 POLITICAL AGENCY OF A STONE – STEĆCI IN THE WESTERN BALKAN REGION

Author: Dr Čaval, Saša - Scientific Research Center of the Slovenian Academy of Sciences and Arts, Ljubljana, Slovenia (Presenting author)
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Keywords: Medieval, tombstones, Balkan
Presentation Preference: Oral

Stećci are the medieval tombstones, dotting the landscapes of Serbia, Croatia, Montenegro, Kosovo, and in particular Bosnia and Herzegovina (BiH). The specific funeral phenomenon represents a vast, unexploited and wholly unique repository of archaeological data revealing social and political dynamics between 12th and 16th C in the Western Balkan. Considering the time depth and geographical region, it's remarkable that stećci cannot be attributed to any specific ethnicity (Vlachs, Bosnians, Herzegovinians, Croats, Serbs, Montenegrins) or religion (Orthodox Christianity, Roman-Catholicism, Islam, Bosnian Church). Through their numerous shapes, copious ornaments and epitaphs, the tombstones embody a unique fusion of traditions, religions, artistic expressions, and languages (Bosnian Cyrillic, Glagolitic and Latin script). Over 60,000 of stećci in BiH alone embody centuries of Bosnian tolerance, which evolved from long-lasting cohabitation of different ethnicities and religions but was so tragically challenged at the end of the 20th C.
Political agency of stećci can be understood from the epitaphs, which speak about different classes, ethnicities, and confessions. An entirely different politicisation of this heritage by Austro-Hungarian Empire (AHE) at the end of the 19thC, tried to create dissent within various groups in Bosnia, as well as between Bosnians and Serbs. The AHE, following then valid "nation-state" creation practice, used stećci as a material symbol of Bogomilism. Although Bogomil theory has long been abandoned, it's still widely adherent to by many Bosniacs, and claims, that stećci are exclusively "Bosnian" heritage, still arise. It's evident that their political agency is very much dependent upon the development of both critical history and archaeology in the area.
The power and the inspiration of stećci was recognized in 2016, 15 years after the Yugoslav wars, when the joint application of Croatia, Serbia, Montenegro and BiH placed this material culture on UNESCO World Heritage list, which gives stećci a new political connotation.

06 MATTER IS THE STORYTELLER: TRANSLATING THE TALES OF STONE

Author: Ms Foreman, Penelope - Bournemouth University (Presenting author)
Keywords: materiality, stone, reflexive
Presentation Preference: Oral

The past is a made thing. Archaeologists interpret the past in a variety of ways, telling an old story for new audiences. Stone is at once a constant and a many-faceted variable in this story - solid, unchanging, movable, malleable, chameleonic in meaning and interpretation through time. This paper seeks to question how we translate these old stories, particularly those relating to stone monuments in the landscape, and how we can develop new translations. By examining human and non-human agents through both digital and analogue means, this research allows for nuanced and complex depictions of the past to be developed.

However, these translations can only occur if these methods are continually and critically evaluated, and the limitations and affordances are fully examined to produce meaningful outcomes. To explore some of these, this paper looks at the ways both human minds and digital programmes look at the past, present, and future of stone, and how both human and digital contribute to a broad, but still subjective, imagining of the past.

07 GROWING STONES: STONE ECOLOGIES IN THE KARST PREHISTORY

Author: Dr Mlekuž, Dimitrij - University of Ljubljana (Presenting author)
Keywords: stone, ecology, materiality
Presentation Preference: Oral

Approaching the diversity of relations between human and non-humans, creatures, things, stuff, but also different ways non-humans relate to each other is a key to an archaeology that does not radically separate humans and non-humans. We need more potent, more complex understandings of its materiality, its stubbornness, plots, structures, its inherent temporality.
Mapping an ecology of human-lithic enmeshment thus contributes to a re-evaluation of the elemental vitality and the agency of the inhuman and its role in human social order.

On the Karst, limestone plateau on the border between western Slovenia and eastern Italy, new alliances between stone and people began with the erection of fortified settlements and enclosures. This is particularly visible in the landscape, in the form of permanent stone structures, such as barrows, cairns, low stone walls, ... creating new landscape patterns.

Those patterns are the result of new material practices, very simple interactions between people and stones, involving the collection, transport, and deposition of surface rubble on small distances. Stones were collected from the surface and piled into cairns, low banks or dry stone walls on the edges of the cultivated areas.

But stones are not just passive things that can be collected and dumped. They have their own vitality and agency. Increased erosion of topsoil exposed new stones and rubble, that has to be collected and dumped again. Stones literally "grow" in the exposed soil as a response to human intervention. And stones, durable and hard, can also be plastic, as they can be arranged into different forms and patterns.

And because stone persists so long, they are a durable cache of aggregated story. Stone forges relations with us, archaeologist as well, and mediates our relations with past societies, it is a "material connection" that spurs narratives.

08 STONES IN A FIELD: THE GRAVITY AND DARK ENERGY OF STIGMERGIC PROCESS IN HUMAN EVOLUTION

Author: Dr Pope, Matt - UCL Institute of Archaeology (Presenting author)
Keywords: stigmergy semiotics evolution
Presentation Preference: Oral

Stepping back from our engagement with prehistoric stone tools as products of technology and culture, we should attempt tore-encounter them as singularities within dynamic landscape environments. Can we think of such objects as having latent properties which are semiotic and encoded in their material properties, can we theorise the behavioural responses of prehistoric groups and individuals who encounter them in landscapes, can we can further and consider the 'agency' of these 'inanimate' objects. With reference to case studies in the Lower and Middle Palaeolithic, the evolutionary significance, positive and negative on human ecology, society and culture will be considered. In addition the case for a deeply embedded stigmeric entanglement with discarded material culture is considered in the context of later prehistoric monumentality.

09 ROCK-CUT MONUMENTS IN CAPPADOCIA: FROM STUDYING THE CARVING PROCESS TO A BETTER UNDERSTANDING OF A SOCIETY.

Author: Ph-D LAMESA, Anaïs - INP; IFEA (Presenting author)
Keywords: Troglodytes, Cappadocia, techniques
Presentation Preference: Oral

Ancient and medieval carved monuments in Cappadocia – in central Anatolia – are well-known. Thank to historians of art and archaeologists, the changes in the architectural style and in the functions of some monuments are now better understood. However, up to now, no archaeological excavation has been conducted to study Ancient and Medieval times in this area, preventing us from having a good knowledge of the local society. Written sources also are quite laconic about the Cappadocian society of these periods.
In my Ph-D dissertation, I underlined that studying carving process of monuments helps to understand the local society and its evolution. To aim this goal, I crisscrossed the written sources and my own observations of tool-marks in walls of monuments.
On this paper, I would like to focus specifically on one site, Mazı köy located in the heart of the ignimbritic Cappadocia. In this area, Hellenistic and Roman rock-cut tombs as well as Byzantine rock-cut churches are carved in four valleys. First, I will explain shortly the carving process. In a second time, by using the example of three monuments dated Hellenistic, Roman, and Medieval periods, I will highlight the changes in carving process and in the choices of stone-cutters. In a third and last part, in light of these observations, I would propose some economical and technical hypothesis to understand the society living in Cappadoca in the Ancient and Medieval times.

10 CRAGS, CAVES AND COWS. TRACING BIOGRAPHIES OF STONES IN THE PUY-DE-DOME (AUVERGNE, FRANCE).

Author: Sciuto, Claudia - Umea University (Presenting author)
Co-Author: Dr Allios, Dominique - University of Rennes 2
Keywords: Provenance, hyperspectral, GIS
Presentation Preference: Oral

Stone materials can be studied as proxies for human-environment interaction, by analyzing artefacts, technology, raw materials and sources, we can follow the track entangling human societies and landscapes. Humans and stone materials are mutually constituted by their interactions and transformations through time.
The spatial and temporal dimensions of artefacts are fundamental parameters to understand their network of interplay and these variables can be recorded through chemical and digital tools.
We present a case study in the Puy-de-Dome (Auvergne, France), a region characterized by the volcanic range of the Chaine-des-Puys. The attestation of human settlement in this mid-mountain region covers a wide chronology, from Neolithic to our days, marked by a local economy principally based on pastoralism and agriculture. Our research concerns the districts of Murol and Saint Nectaire and the human-environment interaction read through the dynamics of use of geologic resources. In this area various types of stones are available and easy to collect, a diverse range of extraction strategies can be observed from systematic open air quarries to selection of materials from moraines deposits and landslides. A systematic survey and mapping of outcrops and quarries has been carried out, together with a geochemical characterization through close range remote sensing techniques (such as portable Near Infrared Spectrometer and Hyperspectral Imaging) and organized in a GIS database. Mapping the movement and interaction of humans and stone materials in the landscape we can draw the outlines of the socio-economic regional network and describe different intertwined stories.
The project is conducted as international collaboration between the University of Umeå, Sweden, the University of Rennes 2, France, and the geologist-volcanologist Pierre Lavina.

11 A NEOLITHIC COMMUNITY FROM THE PERSPECTIVE OF LITHIC RAW MATERIAL – A BIOGRAPHY OF KNAPPABLE RAW MATERIAL.

Author: Szilagyi, Kata - Eötvös Loránd University - Institute of Archaeological Sciences (Presenting author)
Keywords: Lithic-raw-material, Late-Neolithic, Carpathian-Basin
Presentation Preference: Poster

The investigation's base is chipped stone assemblage which came from Alsónyék-Bátaszék site. The Late Neolithic Alsónyék–Bátaszék site has enormous extension, which reflects in high number of archaeological features and finds and large amount of stone tools (nearly 6000 pieces). I would like to present how connected the prehistoric production to the natural subsistence, the social organization and correspondence of the complex cultural units based on chipped stone tools.
The main aim that we can recognize communities of the centrum and periphery's territory. Thereby technological system of these communities will be mapped. These results help to understand the meshwork of communities. We suppose there was tool making procedure in the whole settlement. Based on the raw material distribution the Late Neolithic community at Alsónyék has got very strong local networks. The local Mecsek radiolarite was good quality and available in sufficient amounts. The geological sources of this radiolarite were located near the settlement. These sources are secondary autochthonous sources, thus the gatherer person/knapping specialist could collect the radiolarite pebbles fairly easy. It means only, thus they didn't have to pursue mining or digging activity. For this reason, the supply had to be organized in space and time. All in all, the Mecsek radiolarite was collected continuously and these activity didn't demand bigger expeditions. The farming communities settled generally more-or-less far from geological sources of lithic raw materials.

263 EARLY MEDITERRANEAN METALLURGY: TECHNOLOGICAL INNOVATION AND CROSS-CRAFTSMANSHIP

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Dolfini, Andrea (United Kingdom) - Newcastle University
Co-Author(s): Murillo-Barroso, Mercedes (Spain) - Spanish National Research Council (CSIC)Klimscha, Florian (Germany) - German Archaeological Institute (DAI), Eurasia Department (Excellence Cluster TOPOI)
Keywords: prehistory, metallurgy, Mediterranean, innovation, craftsmanship
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Early European metallurgy has been at the forefront of archaeological research recently, but investigations have often concentrated on the continental landmass, leaving the Mediterranean Sea, its regions, its coasts, and its islands at the margin of the debate. This is a significant change from the priorities of most 20th century prehistorians, who put the Mediterranean centre-stage in their influential models of culture change and technology transfer. As the diffusionist explanations they favoured fell out of fashion, so did the backdrop of their investigations. This is a problem that urgently demands readdressing given the resurgent interest in the study of early metal technology and objects.
The session invites interdisciplinary debate in prehistoric Mediterranean metallurgy from the Neolithic to the Iron Age. Interaction is sought between archaeologists, anthropologists, and scientists working on the dynamics of metal invention, adoption, and transfer. Moreover, the session encourages examinations of the relationship between early metallurgy and other pyrotechnologies including glass and pottery making. Problems to be explored may include: the signification and materiality of metals; the social dynamics of metallurgical innovation including adaptation, rejection, and change (e.g. from bronze to iron); pyrotechnological cross-craftsmanship and the relationship with the broader cultural repertoire; issues of knowledge transfer including gender, agency, skill, and apprenticeship; the social geography of early metals including exchange routes and frontiers; and the social transformations brought about by metalworking and using. Papers cutting across traditional geographic and period boundaries are especially welcome, as well as those engaging with a plurality of time scales.

01 APPROACHING THE PREHISTORIC INNOVATION-PROCESS OF METALLURGY

Author: Dr. Klimscha, Florian - Excellence-Cluster TOPOI; Deutsches Archäologisches Institut - Eurasien Abteilung (Presenting author)
Keywords: metallurgy, innovation, knowledge
Presentation Preference: Oral

Metallurgy has for a long time been discussed as a possible autochthonous invention of Southeast European origin. However, this picture is heavily blurred by different states of research and publication as well as the different social practices involved with metal deposition.
This paper will discuss the emergence and innovation-process of metallurgy in the 5th and 4th millennium BC in a longue durée-perspective as the result of overlapping socio-technical networks.
While the innovation is certainly driven by local standards of taste and distinction, it needs to be explored why several key developments seem to happen "archaeologically contemporaneous" in a clearly defined area for nearly two millennia. It is discussed whether these developments are the result of the diffusion of pyrotechnical knowledge in yet barely visible (overlapping?) networks. Is it possible to converge on the means of the diffusion or the prehistoric actors involved? On the other hand, the local re-inventions of metallurgical improvements and innovation stages visible in the archaeological record suggest the existence of extensive reservoirs of technical know-how, and entail that impulses "from outside" might actually have been relatively low. Finally the role of central nodes in these networks is brought to attention where available know-how is used to create the foundation for structural changes.

02 KILNS AND DAGGERS... 'EARLY', METALLURGIC POTENTIAL IN THE PONTIC REGION

Author: Ms Uhl, Regina - DAI German Archaeological Institute (Presenting author)
Keywords: Dagger, Kilns, Metallurgy
Presentation Preference: Oral

Early metallurgy in the 5th mil BC results from several advances which took rise in different regions across Eurasia. Among other technologies, the construction of pottery kilns can be highlighted as the first, visible 'taming of fire', which came along with a standardization in ceramic production. It reflects one of the bigger preconditions for the production of early copper and gold tools, and different kinds of jewellery, which as well affected the representation of individuals.
Also in the western pontic region, kilns of the so called Cucuteni-Tripol'e-communities reflect an advanced knowledge in pottery technology, which very likely might have been applied to the production of metal objects. But as direct proofs for such technological applications (e. g. metal workshops) are difficult, mainly the metal objects themselves must serve as hints for the reconstruction of local metall productions.

The first metal daggers emerged around 4000 BC and are widely spread, also in the focused area. In many respects, these early metal weapons comprise several technological achievements, such as the utilization of arsenic copper.
It shall be explored, to which extend metal items were produced in the northwestern pontic area and in how far certain types as the dagger played a major role for the local communities. Beyond that, it shall be asked, in how far this new, silverish object type could also have had a social implication on a wider geographical scale or whether they even might have labelled a certain group of people (e. g. warriors).

03 ASPECTS OF CROSS-CRAFTSMANSHIP AND TECHNOLOGICAL INNOVATION RELATED TO FLINT AND COPPER DAGGERS IN THE ITALIAN CHALCOLITHIC

Author: Dr. Steiniger, Daniel - Deutsches Archäologisches Institut (Presenting author)
Keywords: Chalcolithic, Italy, daggers
Presentation Preference: Oral

The Italian Chalcolithic played an important role during the development of early metallurgy in the central Mediterranean. But metallurgy evolved in a predominantly non-metallic background, where a lot of tools and skills were "lithic" since millennia. The transition during that period is an ideal field for studying technological innovation and cross-craftsmanship. Italy is very rich in copper daggers, but even a larger number of flint daggers are known as well. Bone daggers existed also and daggers are depicted in rock art. Some

dagger types seem to be restricted to burial context, others were tools of everyday use. Some may have been mounted as halberds, others were made in one piece from tip to pommel and equipped with a handle. Some copper daggers show traces of use, others were so thin, they can only be understood as pars pro Toto. A holistic interpretation of them is a serious challenge, when trying to get further than typological description. Social and economic spheres can't be neglected. The simple model that flint daggers were just low value copies of metal blades cannot withstand the critical revision of context and chronology. The picture gets more complex, if we include different metals and alloys, like various fahlore copper types and objects made of silver or antimony and pigments. Besides technological viewpoints and the transfer of skills for producing the semi- and finished objects, raw material procurement and cross-craftsmanship of mining techniques have to be considered also, which leads to very old traditions, that were already in use long before the metal ages. A broader view including regions around the Italian peninsula may help to identify directions and trends and to define its role in the – most probably – always bi- and multidirectional developments.

04 INVENTION, ADOPTION, AND TECHNOLOGY TRANSFER IN EARLY ITALIAN METALLURGY: NEW INSIGHTS FROM RADIOCARBON

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Keywords: metallurgy, innovation, Italy
Presentation Preference: Oral

Recent radiocarbon dates of Italian Copper Age contexts are changing our understanding of the inception and early development of metallurgy in this region. The new dates seem to confirm that, after an early start in the Late and Final Neolithic (c.4500-3600 BC), sophisticated metal technology involving the smelting and working of copper, silver, and antimony flourished in west-central Italy from the early Copper Age (c.3600-3300 BC). However, they also highlight a major difference with northern Italy, which has hitherto been overlooked. In this region, a noticeable gap seems to exist between the first experiences with copper metallurgy in the Late and Final Neolithic and the onset of mature polymetallic technology, which is not documented before 3300-2900 BC. This is intriguingly similar (if not contemporary) to what happens in the western Balkans and northern Alps, where a 'hiatus' marked by a major decline in metal production and use separates early from mature copper technology. The paper explores the northern Italian metallurgical 'hiatus' from a social perspective: does it mark a real decline in the amount of metal objects being produced or is it a visibility bias caused by a change in depositional practices and mortuary rituals? And what does it tell us about technology transfer, the adoption of metallurgy, and the social uses of metalwork by northern and central Italian communities in the 4th millennium BC?

05 PETROGRAPHIC ANALYSIS OF DOMESTIC WARES, TECHNICAL CERAMICS AND BUILDING MATERIALS FROM THE CHALCOLITIC SITE OF LAS PILAS (MOJÁCAR, ALMERÍA)

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Keywords: South-Eastern-Iberia, Chalcolithic, ceramic-petrography
Presentation Preference: Oral

Traditional materials (i.e. bone and lithic tools, and pottery) continued to be important in the day to day life of the Chalcolithic communities of SE Iberia long after the adoption of copper weaponry and tools. In fact, those materials became more abundant and diverse in the archaeological record than metallic goods, which remained relatively scarce. Among those traditional technologies, ceramic goods and other products made of clayey resources exhibit great versatility and were involved in almost every realm of domestic life. Therefore, the transformation of clay-rich materials during the Chalcolithic was carried out in order to address a number of social and technical issues that ranged from architectural needs to ore processing, as well as food storage, cooking and commensality. Every "artefact" resulting from these needs was bound to their own technical constraints, but also to particular use and exchange patterns that cannot only be explained by functional demands.
In this paper the provenance and technological analysis of clayey products from the archaeological site of Las Pilas (Mojácar, Almería; 2578-2457 cal BC, 2461-2276 cal BC) is presented to investigate the implications of those social and technical restrictions for the production and consumption of daily life objects. This includes 25 domestic pottery samples and four individuals from building and unfired clayey materials. Moreover, the relation between ceramic technology and metallurgy is analysed adding the comparative study of 19 crucibles and a tuyère.
Petrographic fabrics have been identified that seem to have formed a ceramic tradition in which raw materials selection and processing were not clearly linked to the function of the objects. The shared practices of raw material manipulation across what might be thought of as functional categories of object offer insight into the entangled social reality in which copper and ceramic traditions were closely connected.

06 METALLURGISTS AND THEIR COLLEAGUES IN EARLY BRONZE AGE AND MIDDLE BRONZE AGE EGYPT

Author: Mgr. et Mgr. Odler, Martin - Czech Institute of Egyptology, Faculty of Arts, Charles University, Prague (Presenting author)
Keywords: Egypt, metallurgy, metalworkers
Presentation Preference: Oral

In the south-eastern part of the Mediterranean, there was a country about which Herodotus thought that its inhabitants "established manners and customs for themselves in a way opposite to other men in almost all matters". As for the Early and Middle Bronze Age, earlier and most recent analyses rather prove that ancient Egyptians followed the path of other contemporary cultures, with the use of almost pure copper, arsenical copper and occasional application of bronze. Ancient Egyptian written and iconographic sources, which provide more fascinating insights into the organization of metallurgy, have been rarely systematized in the past with the aid of material culture.

I would like to approach the phenomena of technological innovations and cross-craftsmanship in earlier periods of ancient Egyptian history using all available sources. The chronology from the Early Dynastic Period to the end of the Middle Kingdom is established in broader terms, making it possible to follow the pace of technological change and innovation within rather precise time estimates. As these periods followed a set of rules for the organization of burials, it is possible to single out the tombs of patrons ordering the craftwork on the one hand, and the graves of the metalworkers and craftsmen themselves on the other hand. The sources speak not only about metalworking specialists but also about the nature of cross-craftsmanship in the studied periods. It followed a chaîne opératoire, and a metalworker was likely to be specialized also in the related crafts of carpentry or masonry. The highest-ranking metalworkers in the administration were moreover engaged in ancient Egyptian religion and in the production of three-dimensional depictions of the deities themselves. On the whole, ancient Egyptian sources cast light on the organization of EBA and MBA metallurgy in the framework of the early state.

07 RECENT METAL DISCOVERIES IN BRONZE AGE CRETE

Author: Professor S Soles, Jeffrey - University of North Carolina at Greensboro (Presenting author)
Keywords: LIA, XRF analysis
Presentation Preference: Oral

Analysis of Late Bronze Age (LBA) metals from the sites of Mochlos and Gournia in eastern Crete has resulted in several discoveries about the source of copper that was being shipped into the Aegean from the eastern Mediterranean and about the technologies that local metallurgists used to produce their final products. Lead isotope analysis (LIA) has pinpointed the geographic source of most copper, but not all, to Cyprus and even identified the Cypriot mines from which it came. X-Ray Fluorescence Spectroscopy (XRF) has produced even more significant results and identified the alloys that went into the production of the finished products. The LBA metallurgists had a sophisticated knowledge of different metals, the effects they produced, and what was needed to produce the desired results whether in ordinary objects of mundane use, or ritual objects and decorative ornaments. The evidence suggests that their metallurgical knowledge originated in Egypt and is a good illustration of the principal of "idea" or "stimulus diffusion" described by Alfred Kroeber (1940), whereby the objects themselves did not travel but the knowledge of how they were made did. It also illustrates a fact about ancient artisans that Homer observed in the Odyssey (XVII, 382-386), namely that artisans are travelers by nature and will travel to the "ends of the earth" to seek esoteric knowledge to improve their skills.

08 REGIONALISM IN THE 'GLOBAL' BRONZE AGE: MEDITERRANEAN IBERIA AS AN EXAMPLE.

Author: Dr Murillo-Barroso, Mercedes - University of Granada
Co-Author: Dr Sureda, Pau - Universitat Pompeu Fabra (Presenting author)
Keywords: Archaeometallurgy, Mediterranean, Prehistory
Presentation Preference: Oral

In this paper we address models of production and consumption of metals developed in Prehistory, both on the Mediterranean coasts of the Iberian Peninsula and on the Balearic Islands, an important contact point between Iberia and the Central Mediterranean.

During the Chalcolithic we witness, on the one hand, the first metallurgical development in the Iberian Peninsula based on an exploitation of regional copper resources and limited supra-regional exchange of metal objects, and on the other hand, the colonization of the Balearic Islands by fully metallurgical societies; although evidence of metallurgical production is still absent and metallic objects are scarce.

During the Bronze Age, a metallurgical growth occurs in both areas. Metals production in the Iberian Peninsula is increased by five compared to the previous period, copper-based ornaments are largely produced and local metallurgy appears on the Balearics for the first time. 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 the Iberian Peninsula is a continuity on a regional scale of production, using local resources and a minor exchange of products on a supra-regional scale. It will not be until the Late Bronze Age/Early Iron Age that both the Balearics and the Iberian Peninsula are integrated into the large Mediterranean commercial circuits.

Possible causes of this metallurgical regionalization in Bronze Age Iberia are discussed: the abundance of copper minerals would detract from social value to metal objects and not to be considered the need for long-distance exchanges? What role did metallurgy really play in socio-economic 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 little incidence in the organization of production?

09 TECHNOLOGICAL INNOVATION IN IRON AGE SILVER PRODUCTION - THE CONTRIBUTION OF SOUTH LEVANTINE SILVER HOARDS

Author: Eshel, Tzilla - Department of Archaeology, University of Haifa (Presenting author)
Co-Author: Dr. Yahalom-Mack, Naama - Institute of Archaeology, Hebrew University of Jerusalem; Prof. Erel, Yigal - Institute of Earth Sciences, Hebrew University of Jerusalem; Prof. Gilboa, Ayelet - Department of Archaeology, University of Haifa
Keywords: Silver, Provenance, Phoenicians
Presentation Preference: Oral

Production of silver from lead ores via cupellation is a technological innovation attributed to the 4th millennium BCE, continuously used throughout the Bronze and Iron Ages. It has been suggested that in early stages silver was produced from secondary surface lead deposits formed by the weathering of deeper primary deposits. The exploitation of primary sulphide and galena deposits for silver production are claimed to be later technological developments, triggered by the exhaustion of the surface lead ores. The production of silver from the Iberian Jarositic earths, through the addition of lead, is yet another technological development.

The Phoenicians are considered the major producers and traders of silver from Europe to Asia via the Mediterranean during the Iron Age, supplying rapidly increasing demands of silver for the Assyrian empire, which in turn enabled free trade and maritime mobility. There is no doubt that starting from the 8th century BCE onwards, the Phoenicians established colonies near silver production centers around the Mediterranean. However, regarding the Early Iron Age, scholars had not yet established the earliest date for Phoenician activity in the west, possibly beginning in the 10th or 9th centuries BCE. This stage, often termed 'pre-colonization', did not leave explicit archaeological evidence, and is therefore debated. Another controversy is whether the Phoenicians, beyond being successful maritime navigators, also discovered the potential of unexploited silver-bearing deposits, such as the Iberian Jarosites.

We suggest to contribute to this discussion by determining the provenance of South Levantine Early Iron Age silver hoards, dated throughout the 11th – 9th centuries BCE. Based on LIA, detailed chemical analysis and comparison to Bronze Age and Late Iron Age hoards, we reconstruct changes in the origin of silver. An association between the Phoenicians, new ore sources and technological change in the production of silver is indicated by the finds.

10 TRADE OF GOODS, TRADE OF KNOWLEDGE: THE SITE OF SANT'IMBENIA (ALGHERO) BETWEEN THE EAST AND THE WEST

Author: Ms Baldinu, Emanuela - Università di Sassari
Co-Author: Mr Deaddis, Roberto - Università di Sassari (Presenting author); Ms Fogarizzu, Giulia - Università di Sassari; Prof Garau, Elisabetta - Università di Sassari; Dr Sipala, Valeria - Università di Sassari; Prof Mulas, Gabriele - Università di Sassari; Prof Rendeli, Marco - Università di Sassari; Dr Anguilano, Lorna - Brunel University London
Keywords: metallurgy, iron-age, fieldwork
Presentation Preference: Oral

The Nuragic site of Sant'Imbenia lays in the North-West part of Sardinia (Porto Conte's bay -Alghero) and it is interested by economic and social transformations, starting from the end of the 9th century BC. This dynamism makes the local community, which has had traded with foreign merchants , one of the main actors in the central and western Mediterranean mobility. This movement involves the coastal area, which becomes the core within a circuit of exchanges of materials: Sant'Imbenia has acted as a mediator between the Mediterranean and the hinterland where both agricultural and mineral resources were present. In it we can see a "gateway community", a commercial center with mutual benefit for the islanders and the foreign people exchaninge goods and knowledge.
The project aims the archaeo-metallurgical analysis of samples from the archaeological site and the mining areas located on its territory: the aim is to identify all the steps from mining to the object at Sant'Imbenia during the Iron age. We will focus our attention on a specific a room of the site where we suppose there were pyro-technological activities. The stratigraphic excavation, accompanied by chemical analysis in situ has allowed the identification of a workshop specialized on metallurgical activities.

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265 ENVIRONMENTAL CHALLENGES FOR THE MEDIEVAL NORTH ATLANTIC WORLD

Theme: 6. Interpreting the archaeological record
Author: Schofield, Edward (United Kingdom) - University of Aberdeen
Co-Author(s): Mighall, Tim (United Kingdom) - University of AberdeenEdwards, Kevin (United Kingdom) - University of AberdeenErlendsson, Egill (Iceland) - University of Iceland
Keywords: North Atlantic, Medieval, Norse, environment
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The high-latitude North Atlantic periphery and its islands witnessed major political, social, economic and environmental changes during the Medieval Period (ca AD 500-1500). Among the many characteristic developments were: the transformation of small-scale northern European tribal societies into medieval kingdoms; a Norse diaspora from Scandinavian homelands, including the settlement of both occupied (e.g. the Northern Isles of Scotland and Newfoundland) and largely unoccupied and 'pristine' landscapes (the Faroes, Iceland and Greenland); the expansion and increasing commercialisation of northern trading networks for goods such as dried fish and furs; and, issues of resilience or, in extreme cases, the abandonment of certain western European outposts (e.g. Greenland, Newfoundland) located at the margins of the Old and New Worlds. These events occurred against a backdrop of significant environmental intervals, including two major climatic perturbations – the so-called 'Medieval Warm Period' and 'Little Ice Age'. Northern European societies were also variously faced with other significant challenges (e.g. outbreaks of bubonic plague, and volcanism in Iceland).

This session invites contributions that consider any aspect(s) of the above. In doing so, we hope to stimulate debate about the challenges faced by, and opportunities open to, northern European societies in the North Atlantic region during the Medieval Period. In addition to a fresh look at data emanating from existing approaches using biological, chemical and physical proxies, we wish to especially encourage papers that highlight novel methods or perspectives in exploring the relationships between people, landscape, resources and climate across the medieval North Atlantic world.

01 BOTANICAL EVIDENCE OF AGRICULTURAL CHANGE FROM PREHISTORIC CULTIVATION LAYERS IN WESTERN NORWAY

Author: Dr Fredh, Erik Daniel - University of Stavanger (Presenting author)
Co-Author: Prøsch-Danielsen, Lisbeth - University of Stavanger
Keywords: cultivation, pollen, ordination
Presentation Preference: Oral

The society in western Norway has experienced substantial changes in prehistoric times. In this region, an agricultural economy, including both crop cultivation and animal husbandry, was introduced relatively late. During recent decades, a large number of cultivation layers, dated to between c. 2000 BC and c. AD 1500, have been identified during archaeological excavations. In this study, pollen samples from 57 of these cultivation layers (from 21 archaeological sites) have been compiled and analysed using multivariate analyses to investigate the variation in crop plants and associated weeds trough time. The combined data set shows that the pollen composition varies substantially between sites. Distinct changes are also observed during the Medieval Period, in particular regarding the amount of cultivated crops. Some weeds are also related to different crop plants and some weeds are related to charcoal composition. The observed variations may be related to changes in agricultural practice, environment and society.

02 AN ARCHAEOBOTANICAL APPROACH TO THE 6TH CENTURY CRISIS IN SOUTHWESTERN NORWAY.

Author: Ph.D. student Westling, Sara - Museum of Archaeology, University of Stavanger (Presenting author)
Keywords: macrofossils, Southwestern-Norway, 6th-century-crisis
Presentation Preference: Poster

In my Ph.D. project I investigate the apparent decline in population and economy in southwestern Norway starting in the 6th century AD. I study the agricultural development, crop composition and manuring practices, using plant macrofossils in combination with other scientific methods, such as isotope analysis on charred cereals. The project makes use of the extensive plant macrofossil material collected by the Museum of Archaeology, University of Stavanger and aims to elucidate whether any changes in the material over time can be detected. These could indicate a crisis or an adaptation to new conditions; climatic, demographic or otherwise. My poster will present the project and some preliminary results.

03 CONTINUITY OR CHANGE? LANDSCAPE CHANGE DURING EARLY MEDIEVAL TIMES IN NORTHEAST SCOTLAND

Author: Dr. Mighall, Tim - University of Aberdeen (Presenting author)
Co-Author: Ms McHardie, Laura - University of Aberdeen; Dr Schofield, Ed - University of Aberdeen; Dr Noble, Gordon - University of Aberdeen; Dr Foster, Sally - University of Stirling
Keywords: Picts, landscape, human-impact
Presentation Preference: Oral

The Picts were an indigenous people who inhabited northern Scotland in the early medieval period c. AD 400-900. Despite renewed archaeological interest and research into the Picts, there has been little focus on the impact they had on their environment. This paper will examine human-environment interactions during the Pictish period in northeast Scotland, in particular to establish whether the first millennium AD was a period of continuity or a time of change. We present pollen, non-pollen palynomorph and microscopic charcoal records from sites across northeast Scotland to provide evidence for human activity. Such an approach is insightful and has previously been used both independently of, and also complimentary to, archaeological investigations. The data generated in this project will provide a wider landscape context to questions that arise from the archaeological evidence during a period encompassing important cultural changes.

04 IN SEARCH OF THE VIKINGS: A MULTI-PROXY PALAEOENVIRONMENTAL INVESTIGATION FROM THE LOCH OF TUQUOY, WESTRAY, ORKNEY.

Author: Dr Timpany, Scott - Archaeology Institute UHI (Presenting author)
Co-Author: Dr Mighall, Tim - School of Geosciences, University of Aberdeen
Keywords: Norse, Archaeology, Palaeoenvironmental
Presentation Preference: Oral

Archaeological excavations of an eroding coastal section at Ness of Tuquoy, Westray, Orkney in the 1980's revealed the remains of a Norse and Medieval settlement, dating to 9th to 12th centuries AD. Amongst the structures uncovered were a late Norse 'hall' and other buildings, including a possible metalworking smithy. A waterlogged deposit of a possible byre or pit of 9th century AD date contained a wealth of palaeoenvironmental evidence ranging from worked wood (sourced from possible indigenous trees and driftwood), insects, waterlogged and charred plant remains together with pollen. This evidence suggested a farming community were present at Tuquoy, keeping livestock and cultivating cereals of mainly oat and barley.
However, the palaeoenvironmental information from the possible byre or pit provided only a snapshot of information from one phase of occupation at Tuquoy. Therefore, a number of additional questions such as was there any evidence of human activity in this area prior to this settlement? What was the scale of cultivation and did this change over time? Does any evidence of metalworking remain in the wider environment and to what scale? What was the nature of the local woodland resource and does it match the waterlogged worked wood finds? In order to answer these questions it was deemed necessary to return to Tuquoy and to sample the now drained Loch of Tuquoy, some 250m from the excavated site, to provide material for a multi-proxy palaeoenvironmental study including pollen, non-pollen palynomorphs (NPPs), mineral magnetics, geochemistry, loss on ignition and radiocarbon dating. This paper presents the results of this study and at the same time provides the first long-term vegetation record for the island of Westray, together with the task of aligning the results of two studies separated by some 30 years.

05 A SPATIALLY EXPLICIT PALAEOENVIRONMENTAL RECONSTRUCTION OF HUMAN-ENVIRONMENT INTERACTIONS IN THE LAXÁ RIVER VALLEY, NORTHEAST ICELAND

Author: Hiles, William - School of Geography and Sustainable Development, University of St Andrews (Presenting author)
Co-Author: Dr Lawson, Ian - School of Geography and Sustainable Development, University of St Andrews; Dr Streeter, Richard - School of Geography and Sustainable Development, University of St Andrews; Dr Roucoux, Katherine - School of Geography and Sustainable Development, University of St Andrews
Keywords: landnám, palaeoenvironment, spatial
Presentation Preference: Oral

One challenge facing palaeoenvironmental reconstructions in Iceland is understanding the interactions between environmental and anthropogenic forcing mechanisms. The Laxá river valley in northeast Iceland was settled early in the Icelandic landnám period. Settlers dispersed rapidly along an altitudinal gradient, from lowland coastal areas to highland areas which today are within the margins of the central desert. Along this same gradient, a harsher environment towards the highlands forced the dominant birch woodland ecosystem closer to its climatic threshold. As the area transitioned from the Medieval Warm Period into the Little Ice Age, the climatic limits of these ecosystems would have moved even closer in many areas that were, by that point, also under stress from human activities. This presentation will focus on the spatio-temporal patterns in environmental and anthropogenic drivers that have contributed to landscape change in the Laxá river valley over the last three millennia. It will present preliminary palaeoenvironmental work on a number of lake cores distributed along the altitudinal and environmental gradient. This will first include an attempt to develop an understanding of variations in human activities on a spatial scale while also considering the sites' positions in the landscape and the environmental conditions they have experienced through time. It will then aim to present initial steps towards a coherent synthesis of the relative contributions of human activity and these prevailing conditions to environmental degradation. In doing so, it will test the null hypothesis that human activity is the dominant driver of post-settlement landscape change in the region.

06 TAKING ADVANTAGE OF AN ENVIRONMENTAL CHALLENGE: DID CEREAL PRODUCTION ENABLE THE ENFORCEMENT OF HIGH SOCIAL STATUS IN ICELAND?

Author: Dr. Erlendsson, Egill - University of Iceland (Presenting author)
Co-Author: Mr. Riddell, Scott - University of Iceland; Professor Edwards, Kevin - University of Aberdeen
Keywords: Palynology, cultivation, status
Presentation Preference: Oral

Owing to climatic conditions, Iceland is at present near the margin of viability for barley (Hordeum) cultivation. The latter is economically sustainable mainly because of the availability of artificial fertilizer and modern technological improvements; and this only in warmer areas of the southern lowlands and in some inland locations in the north. Palynological, botanical, historical and archaeological evidence suggest that cereals (mainly barley) were also grown in Iceland during the medieval period. Without the aid of modern technology, this must have presented a significant challenge. In this paper we argue that such a challenge also represented an opportunity for individuals to enforce, or underscore their higher social status through barley production, allowing brewing of the alcoholic beverages associated with feasting. In support of our proposition, we present a case study in which land use at four farms in Mosfellsdalur, SW Iceland, was examined palynologically. At the Mosfell estate, believed to be the highest ranked farm and a chiefly household, palynology shows that cereals were grown more or less continuously from the time of settlement until c. AD 1200. At the three other farms our pollen data indicate that farming was exclusively pastoral. On this basis we propose the hypothesis that cereal production was more likely to be practised at high status farms and, consequently, that palynology can add a predictive, diagnostic element to the assessment of the social status of medieval Icelandic farms.

07 MONASTICISM & LAND USE IN ICELAND

Author: Riddell, Scott - University of Iceland (Presenting author)
Keywords: Monasticism, Land-use, Iceland
Presentation Preference: Oral

From the 11th century, approximately 14 monasteries were established in Iceland concurrent with a revival in European monasticism (AD 1100-1400). To date, despite being significant landowners, the contribution and impact of monasticism on Icelandic society and the environment has conventionally been considered limited. Furthermore, the orthodox view holds that Icelandic monasteries were remote from the main body of the Roman Catholic Church. Recent archaeological investigation at Skriðuklaustur in eastern Iceland suggests that the latter convention may not hold true. Architectural features at Skriðuklaustur conform to Roman Catholic ideology while a medical function is apparent via inhumation (skeletal pathology), artefacts (medical implements) and pollen (medicinal plants). On this basis, it is proposed that monasteries in Iceland may have also been a vector for land use change in common with European monasticism e.g. woodland clearance, land drainage and plant introductions in Norway, Scotland, Ireland, England and France in the medieval period have been linked to monasticism. In order to discern whether or not such change is manifest in the Icelandic environmental record, sedimentary sequences have been acquired from within the boundaries of former monastic landholdings. Palynological and lithological techniques have been applied and preliminary material from Þingeyrarklaustur and Helgafellklaustur are presented.

08 COMPARATIVE ISLAND ECODYNAMICS IN THE NORTH ATLANTIC: THE MEDIEVAL CONTEXT

Author: Associate Professor Harrison, Ramona - University of Bergen; Research Associate (Presenting author)
Keywords: Climate-change, Resilience, NW-Atlantic
Presentation Preference: Oral

Supported by a three-year US NSF Comparative Island Ecodynamics (CIE) grant, this North Atlantic Biocultural Organization (NABO) multidisciplinary research program improves scientific understanding of the complex interactions of human governance, climate change, human environmental impact, and world system effects as observed on medieval Scandinavian communities in the NW Atlantic.

One of the main questions this research project aims to address is why one northern community achieved sustainability on the millennial scale, while its neighbor to the west experienced genuine social-environmental system (SES) collapse. This happened despite centuries of successful adaptation and a comparatively resilient economic management. From our multi-disciplinary data sets we learn that Icelanders survived centuries of adverse climate, volcanic eruptions, large scale soil erosion, epidemic disease, and harsh world-system economic impacts to develop a modern society now ranking high in international assessments of quality of life. We also learn that their relatives in Norse Greenland suffered complete extinction by the mid-15th century CE.

This presentation is the result of a shared interest in these questions by our research collaborative and focuses on some of the major findings from Icelandic and Greenlandic case-studies as part of this international project.

09 IS THERE A PALYNOLOGICAL EXPRESSION OF SHIELING USE/TRANSHUMANCE WITHIN THE NORSE NORTH ATLANTIC?

Author: Professor Edwards, Kevin - University of Aberdeen (Presenting author)
Co-Author: Dr Erlendsson, Egill - University of Iceland; Dr Ledger, Paul - University of Aberdeen; Dr Schofield, Edwards - University of Aberdeen
Keywords: shieling, Atlantic, palynology
Presentation Preference: Oral

The practice of exploiting summer pastures for livestock grazing was widespread in the Norse North Atlantic and it probably had its beginnings in prehistoric Europe and beyond. This system of transhumance, whereby farmers moved animals to relatively remote pastures, reduced the grazing pressure on land close to main farms and preserved more productive infields for winter fodder production. Such transhumant activity is reflected in buildings (the shieling, sæter, sel, ærgi), often at altitude, which are characteristically small and which are sometimes fairly close to a main farm, but can also be at distance. Larger buildings, or collections of structures, are also known, though there remains a lack of excavation and chronological evidence. Depending on resource availability, shieling activity included the production of dairy products, haymaking, charcoal manufacture, craftwork, peat cutting and possibly hunting. The detection of such activities in pollen records is not straightforward and this is examined along with a consideration of model patterns of palynological expectation and observation using examples drawn from Greenland, Iceland and the Faroe Islands.

10 NORSE IMPACTS ON THE VEGETATION AND LANDSCAPE OF THE WESTERN SETTLEMENT, GREENLAND

Author: Dr Schofield, J. Edward - University of Aberdeen (Presenting author)
Co-Author: Prof Edwards, Kevin J. - University of Aberdeen
Keywords: Greenland, Norse, vegetation
Presentation Preference: Oral

The Western Settlement comprised around 80 farms situated amongst the inner fjords largely to the northeast of the modern Greenlandic capital of Nuuk (64º10"N, 51º35"W). The Settlement is generally regarded as having been occupied from c. AD 1000-1350, although precise dates for the establishment of individual farms and their abandonment are still largely unavailable. The Western Settlement was seemingly at an agricultural disadvantage when compared to its larger counterpart (the Eastern Settlement) 500 km to the south; the former contended with steeply incised, rugged and mountainous topography, free from sea ice yet very close to the Arctic Circle. It was, though, well positioned to access walrus hunting grounds (Norðrsetr) around Disko Bay.

Questions may be raised about the settlement's primary function, and the relative importance to its inhabitants of farming versus hunting lifestyles. In terms of the impacts arising from settlement, there are relatively few studies of vegetation and landscape available for the area. The pioneers in this field – Johs. Iversen and Bent Fredskild – interpreted subtle indications for scrub clearance through burning, yet their investigations were few in number and of low resolution, being small components of broader inquiries that were more focused upon reconstructing long-term (Holocene) vegetation histories. In this paper we present new high-resolution palaeoecological studies of vegetation change from a suite of Western Settlement farms located in seemingly agriculturally-marginal locations close to the Greenland Ice Sheet. We consider whether a diagnostic and repeatable palynological 'footprint' for Norse settlement can be identified for this region, as it has been for the more widely studied Eastern Settlement. In doing so, we hope to advance ideas about the character, intensity and effectiveness of past agricultural systems, and the challenges that farmers faced, when operating in subarctic environments.

11 NORSE IRRIGATION ACROSS THE NORTH ATLANTIC: A MULTI-DISCIPLINARY APPROACH TO AN EMERGING ISSUE

Author: Dr Schofield, J. Edward - University of Aberdeen (Presenting author)
Co-Author: Prof Edwards, Kevin J. - University of Aberdeen
Keywords: Greenland, Norse, irrigation
Presentation Preference: Oral

The sustainability of farming in subarctic North Atlantic environments was dependent upon the production of sufficient hay to feed stalled animals over long winters. Apart from coping with the difficulties of low temperatures and a short growing season, an emerging issue is the extent to which Norse farmers were reliant upon irrigation as a buffer against drought. This is highlighted in the Eastern Settlement of Greenland. There, the presence of interconnected landscape features are identified as irrigation channels and dams amongst the ruins of several Norse farms, including the high-status episcopal farm site of Garðar/Igaliku. Parallels have been drawn with systems in Iceland and Norway, leading to the suggestion that irrigation may have been introduced to Norse Greenland in the 11th century AD by the first bishop (a Norwegian) and his retinue, though the details remain sketchy. Although some of the Norse irrigation systems in Greenland have been mapped, most have attracted little further investigation. In few cases has research been extended to include archaeological excavation to prove supposed irrigation features, nor has there been much consideration as to how irrigation networks were integrated with other aspects of the farming system, such as crops/vegetation and soils. The hydrological and hydraulic characteristics of the Norse irrigation networks and their catchments have important implications for our understanding of water management and the effectiveness of the agricultural systems which they service, yet these parameters are also unknown. This paper introduces new research that will address these issues through a multi-disciplinary examination of irrigation systems at sites in Greenland, Iceland and Norway. The approach will involve integrating aspects of archaeology with a wide range of other disciplines including geographical information systems, history, hydraulic engineering, palaeoecology, palaeoclimatology and pedology.

12 FUTURE DIRECTIONS FOR PALAEOECOLOGY FOLLOWING A DECADE OF DISCOVERY IN NORSE GREENLAND

Author: Dr Ledger, Paul - University of Aberdeen (Presenting author)
Co-Author: Dr Schofield, J. Edward - University of Aberdeen; Professor Gauthier, Emilie - Université de Franche-Comté; Professor Edwards, Kevin - University of Aberdeen
Keywords: Norse, palaeoecology, Greenland
Presentation Preference: Oral

The past decade has witnessed a resurgence of interest in the environmental impact of Norse settlers in southern Greenland. As a result of a series of multidisciplinary research projects, palaeoenvironmental data covering the Norse settlement period in Greenland (c. AD 985 to 1450) has almost tripled to encompass twenty-three sequences, embracing a variety of palaeoecological media including anthrosols, mires, peaty hollows, coprolites and lakes. Prior to 2007, palaeoecological data pertaining to the landscape impacts of Norse settlers in southern Greenland was limited to eight sequences associated with the pioneering thesis of Bent Fredskild. This highly influential work identified landnám (settlement) as having a detrimental impact on the environment of southern Greenland. The introduction of pastoral agriculture was linked to a widespread reduction in the shrub and woodland cover, increased soil erosion and the spread of grasses and weeds. These findings chimed with the zeitgeist, which presented the Norse as poor custodians of a landscape impoverished by the deteriorating Little Ice Age climate of the 12th to 15th centuries, and in 2005 were widely popularised in Jared Diamond's bestseller 'Collapse.' Yet, this narrative was constructed on the analyses of profiles with low temporal resolution that, in the most part, were distant from archaeological activity. Recent work has sought to provide a more rounded understanding of the Norse period. Newly popularised proxies such as non-pollen palynomorphs have been deployed, higher resolution analyses undertaken, advances in radiocarbon dating and modelling brought to bear and a comparative perspective with modern farming pursued. This paper presents a synthesis of this decade of research and asks what we have learned, whether narratives have changed and where we go next.

267 AGGLOMERATIONS: TOWARDS A COMPARATIVE UNDERSTANDING OF SETTLEMENT DYNAMICS

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Schreg, Rainer (Germany) - Roemisch-Germanisches Zentralmuseum; Eberhard-Karls-Universität Tübingen, Germany
Co-Author(s): Gronenborn, Detlef (Germany) - Römisch-Germanisches Zentralmuseum Mainz, Germany; Johannes-Gutenberg-University Mainz, Germany; Witwatersrand University, South AfricaEichert, Stefan (Austria) - Vienna UniversityBonsall, Clive (United Kingdom) - University of Edinburg
Keywords: Settlement dynamics, agglomerations, towns, pre-urban
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Ever since the early days of archaeology, the phenomenon of humans living together in large and continuously occupied sites and settlements has been a subject of intensive research. Such agglomerations – be they camp sites, villages, towns, or cities – must be understood as products of complex social, environmental and economic processes. Today, a vast number of case studies from a multitude of periods and regions exist that provide valuable data on settlement development and processes of social change. Thus, it is time to work with greater emphasis on a theoretical and methodical framework which would enable a comparative evaluation of these data, crossing the boundaries of research traditions. Such a comparative approach renders it possible to improve the understanding of the dynamics from a long-term perspective, going beyond traditional settlement archaeology. We invite speakers to present case studies dealing with changing forms of agglomerations for either prehistoric or historic periods. Participants should focus on aspects with potential for comparative studies. We particularly welcome contributions on methodical approaches with a strong theoretical emphasis.

01 THE IRON GATES MESOLITHIC – A CASE OF HUNTER-GATHERER COMPLEXITY?

Author: Professor Bonsall, Clive - University of Edinburgh (Presenting author)
Co-Author: Dr Boroneanț, Adina - Romanian Academy of Sciences "Vasile Pârvan" Institute of Archaeology
Keywords: Mesolithic, hunter-gatherers, complexity
Presentation Preference: Oral

The post-glacial hunter-gatherers of the Iron Gates have been widely regarded as a classic example of a complex foraging society. But just how "complex" were they and does the evidence indicate increasing social complexity with time? The issue is re-examined in this paper, with emphasis on patterns of residential mobility/permanence, settlement dynamics, subsistence, technology, mortuary practices, demography and social organization.

02 EARLY CITIES OR LARGE VILLAGES?: QUANTITATIVE NARRATIVES ON ENEOLITHIC TRYPILLIA MEGA-SITES, UKRAINE.

Author: Dr. Nebbia, Marco - Department of Archaeology, Durham University (UK) (Presenting author)
Keywords: Trypillia, Megasites, Proto-Urbanism
Presentation Preference: Oral

During the 4th millennium BC a number of considerably big settlements have developed in the territory of modern Ukraine, thus constituting the biggest sites in Europe at that time. Mostly investigated only as single entities these "mega-sites" have never been considered thoroughly as part of the whole landscape of Trypillia coeval settlements. Some scholars have argued that these could have been examples of early formed urban centres (aka "proto-cities") (Videiko 2004), others, instead, proposed that these were big villages (Bandy 2008) without a clear social hierarchy visible in site organization, structure and material culture. This research represents the first systematic study of the wider settlement pattern of known Trypillia sites and how this has been affected by (and affected) the appearance of mega-sites at the beginning of the 4th millennium BC.
Quantitative analyses are performed 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.
Concepts like 'seasonality' and 'heterarchy' are used to explain the development and the social organization of megasites, which are conceived as temporary gathering places where an 'urban-like' identity starts to develop.
The results suggest that Trypillia megasites can be defined as 'urban forms' within their coeval settlement and social context, but in the long-term perspective of the last six millennia they are "only" large/overgrown villages. 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.

03 YOUNG NEOLITHIC MEGA SITES OF THE MICHELSBERG CULTURE IN WEST-CENTRAL EUROPE

Author: Professor Dr Gronenborn, Detlef - Roemisch-Germanisches Zentralmuseum (Presenting author)
Keywords: Mega Sites, Neolithic,
Presentation Preference: Oral

Around and after 4000 cal BC large parts of western Eurasia experience a curious phenomenon, namely the rather sudden appearance of enormously extensive habitation and hilltop sites, of which many appear to have been enclosed habitation or rather large village sites.

The agropastoral Michelsberg culture is the first archaeological entity in West-Central Europe for which such Mega-Sites sites have been proven. Impressive examples are Urmitz, Kapellenberg, or Glauberg. These have been investigated in the course of an ongoing long-term project on the Neolithic at the Roemisch-Germanisches Zentralmuseum/ Johannes-Gutenberg University, and the current results of this project will be presented. Michelsberg Mega sites will also be discussed as examples of agglomeration processes in a long-term perspective.

Detlef Gronenborn; Sandra Fetsch; Elisabeth Freund; Sabine Kuhlmann; Jonas Nowaczek

04 SOME RECENT CASE-STUDIES ABOUT LATE CHALCOLITHIC NEAR EASTERN AGGLOMERATIONS: WHICH REGULARITIES BEYOND FORMAL DIFFERENCES?

Author: Dr. Baldi, Johnny Samuele - Ifpo Beyrouth (Presenting author)
Keywords: Near-East, proto-urban, Chalcolithic
Presentation Preference: Oral

The evidence for local ways towards social complexity appears as a major outcome in chalcolithic Northern Mesopotamia and in the Levant. This paper aims to compare different modalities for the emergence of lathe chalcolithic agglomerations through recent evidences for rural or proto-urban centers. In particular, the emergence of Byblos as a major Levantine town is here presented through the reconstruction of the technical and ceramic relations between some small settlements in its surrounding area. In northern Syria, the rural agglomeration of Tell Feres al-Sharqi is presented as an organic portion of the cluster of villages in the territory of an emergent proto-city (Tell Brak). Eventually, the agglomeration of Dinkha, in the Zagros Piedmont (Iraqi Kurdistan) emerges both from a cluster of hamlets and from a network of little settlements. Despite their formal differences, these three case-studies illustrate some precise and long-lasting organizational rules for the appearance of complex proto-urban agglomerations in the late chalcolithic Near East.

05 CONTRADA DAMALE: A NEW TYPE OF BRONZE AGE SETTLEMENT IN SOUTHERN ITALY

Author: Dr de Neef, Wieke - University of Groningen (Presenting author)
Co-Author: Dr Van Leusen, Martijn - University of Groningen; Dr Armstrong, Kayt - University of Durham
Keywords: Protohistory, Italy, settlement
Presentation Preference: Oral

Successive landscape-archaeological studies by the Groningen Institute of Archaeology (GIA) have since 2002 recorded a cluster of 68 protohistoric pottery scatters in the Contrada Damale, a gently undulating sloping agricultural zone of ca. 200 hectares in the foothills overlooking the coastal plain of Sibari (Calabria, southern Italy). Intensive multi-disciplinary investigations of these scatters in the years 2010-2015 including re-surveys, geophysical work and soil studies, have allowed us to date 52 of these scatters to the last phase of the Bronze Age (Final Bronze Age; ca. 1150-950 BC) mainly by the presence of a particular type of large storage vessel. Some of these scatters are associated with rectangular geophysical anomalies interpreted as the foundations of hut walls, and shown to be of the same period. Until now, such storage vessels and rectangular structures were thought to be exclusive to large, central settlements with defensive features.
We believe, and will argue in the paper, that this is caused by a persistent research bias towards the more obtrusive central places, and instead present the Contrada Damale settlement as the first example of a new settlement type for this period and region: the 'open village'. We will discuss potential objections to this interpretation, and speculate on how it might have emerged from preceding Recent Bronze Age (ca. 1300-1150 BC) dispersed habitation and disappeared again in the Early Iron Age (ca. 950-725 BC), drawing on both theoretical considerations and evidence relating to the internal spatial distribution and variations in site size, assemblage, and associated subsurface remains.

06 ONE AGGLOMERATION, TWO MAJOR SITES?

Author: Ms Eymard, Sandra - University of Toulouse Jean Jaurès (Presenting author)
Keywords: Agglomeration, hierarchy
Presentation Preference: Oral

The Late Prehistoric agglomeration 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). This peculiar structure, rare in the western Late Prehistory, has led the researchers to debate the existence of two possible models. The first proposes that both sites coexisted and had equal rank , while the second proposes a hierarchy between both sites: the. hillfort of Vieille-Toulouse would concentrate the political powers, while Saint-Roch would only be a market place.
These two agglomerations take place in a specific historical context, marked by close links with Rome, whose direct intervention in the Toulouse area intervention towards 100av. J.-C. probably lead to the abandonment of Saint-Roch . On a long-term perspective, the material record appears strongly impacted by Mediterranean influences. Local population was deeply involved in long-distance trade, while clear archaeological traces show the presence of foreigners coming from various areas of the ancient world. Most of this archaeological material, however, proceeds from ancient excavations of wells and shafts –most of them date back to the 1960s-1970s-, thus complicating a spatial approach of these sites, their archaeological interpretation and their comparison, whether reciprocal or with other sites.
This paper will present the method developed to deal with these issues. Our approach is based on a GIS crossed with a database, which led to the elaboration of a homogeneous documentation according to consistent criteria, therefore allowing for a discussion of the nature of both sites and of their mutual interactions. Moreover, in a context dominated by the indiscriminate use of pre-conceived models, this approach allows for a context-driven analysis of the activities held in two sites perhaps belonging to a unique agglomeration.

07 LOW-DENSITY URBANISM IN IRON AGE EUROPE

Author: Dr Fernández-Götz, Manuel - University of Edinburgh (Presenting author)
Keywords: Urbanism, Low-density
Presentation Preference: Oral

In contrast to densely occupied settlements that would fit within Gordon Childe's classic model of cities, Roland Fletcher's notion of "low-density urbanism" acknowledges the existence of alternative forms of urban agglomerations. In fact, throughout history many urban sites all around the world have been characterized by their large areas and manifold functions but also by low-density occupation of often fewer than 50 people per hectare. Although cases such as Angkor, Cahokia, Great Zimbabwe and Co Loa are among the most famous examples, a large number of Late Prehistoric European sites can also be added to the list, including the 4th Millennium BC Trypillia mega-sites from Ukraine. This paper will explore the applicability of the concept of low-density urbanism to Iron Age Europe, with examples that range from the Late Hallstatt Heuneburg to the Late La Tène oppida.

08 WHAT DOES "THE EARLY MEDIAEVAL AGGLOMERATION" IN EAST CENTRAL EUROPE MEAN? SOME THEORETICAL CONCEPTS AND PRACTICAL CASE STUDIES

Author: Prof. Machacek, Jiri - Masaryk University (Presenting author)
Keywords: agglomeration, Middle Ages
Presentation Preference: Oral

The term "agglomeration" is very popular among the specialist in the Early Medieval archaeology from the East-Central Europe. They use this term for the description of the vast, mostly fortified settlements, which cumulate plenty of various central functions such as power, protection, crafts and cult or trade. The excavations of such settlements from Bohemia, Moravia, Poland, Slovakia, Hungary or Austria show, that we can hardly identify their inner structure or the specific function of different parts as well as their general purpose. In the paper will be discuss various problems of the concept of agglomerations in the Early Middle Ages and it will be present some examples of the possible solutions.

09 THE EARLY MEDIEVAL SITE OF PELLENDORF/GAWEINSTAL - A RURAL SETTLEMENT IN THE "HINTERLAND" OF THE MORAVIAN AGGLOMERATIONS BŘECLAV-POHANSKO AND MIKULČICE

Author: Kühtreiber, Karin - University of Vienna (Presenting author)
Keywords: Early_medieval_settlement, Austria
Presentation Preference: Oral

The site of Pellendorf/Gaweinstal, situated in the north-eastern region of Lower Austria ("Weinviertel") and excavated from 2003 to 2006, is one of the largest early medieval rural settlements currently known in Austria. The site educed three main phases for the early medieval period, dating to the 7th, the 8th and finally the 9th/10th century, each showing a various number of pit houses, pits for storing supplies, kilns and furnaces. The material culture, especially the ceramic finds, reveals closely contacts to Břeclav-Pohansko and Mikulčice and thus indicates a remote influence of these agglomerations into the peripheral regions west of the March-Thaya River. The lecture will provide an insight of the currently conducted research on this settlement and will discuss its cultural connections to the adjacent north-eastern Great Moravian centers.

10 AGGLOMERATIONS IN THE EARLY MEDIEVAL AREA OF TODAY'S AUSTRIA - A COMPARATIVE STUDY BETWEEN THE ALPS AND THE LOWLANDS

Author: Dr. Eichert, Stefan - University of Vienna; Austrian Academy of Sciences (Presenting author)
Keywords: settlements, Austria, medieval
Presentation Preference: Oral

Several dozen settlements are so far archaeologically known from the Austrian Province of Lower Austria especially from the "Weinviertel" at the border to the Czech Republic and Slovakia. From the neighbouring mountainous provinces in the Eastern Alps hardly any physical evidence exists although written sources inform us about more than hundred of them. The paper wants to discuss similarities and differences between the settlements, ask for possible reasons for this contrast and investigate the theoretical and social background that might have lead to the image that the given sources draw.

11 THE MIDLAND CORRIDOR – THE APPEAL OF A NATURAL ROUTEWAY FOR RITUAL AND HABITATION ACTIVITY IN PREHISTORIC AND MEDIEVAL IRELAND

Author: (current PhD. Student) O' Brien, Yolande - National University of Ireland, Galway (Presenting author)
Keywords: #routeway #MidlandCorridor #settlement
Presentation Preference: Oral

The Midland Corridor is the name given by Alfred Smyth to a natural routeway which extended through the Midlands of Ireland in a landscape otherwise dominated by substantial wetlands. This 40km long and 5-10km wide routeway was defined by comparatively dry soils of limestone sand and gravel and limestone till. Smyth discussed it as a medieval routeway, observing the distribution of important ecclesiastical settlements along its course, and it was the means by which the powerful Uí Néill dynasty extended their influence southwards into Leinster. It is a routeway which was also strategically located for prehistoric communication, as it connected the important regions of the catchment area of the River Boyne in County Meath to the County Tipperary region of North Munster.

This paper will explore how this natural routeway attracted ritual and secular activity, movement and settlement throughout prehistory and the medieval periods. The distribution of burials, settlement sites, fulacht fiadh "cooking" sites, depositions and hillforts allow us to hypthosise when and how intensively this routeway was in use, supplemented by pollen data to illustrate the in-flux nature of woodland, farming and settlement. This evidence suggests that the northern extent of the Midland Corridor may date to as early as the Neolithic period for access to the hunting grounds of the wetlands, with the southern extent perhaps coming into use by the Late Bronze Age. Documentary sources of the Early Medieval period include itineraries of early clerics which clearly indicate a routeway through this region. The location of this routeway between the northern and southern portions of Ireland make it uniquely positioned to absorb influences from both regions, which is apparent in evidence ranging from the material of Late Bronze Age hoards to the design of Early Medieval high crosses, with competing influences creating a compelling social dynamic.

12 THE AGGLOMERATIONS OF THE NORTH WESTERN MEDITERRANEAN IRON AGE AND THEIR DYNAMICS: A CASE-STUDY (MALVIEU, SOUTHERN FRANCE)

Author: Dr Gorgues, Alexis - Université Bordeaux Montaigne; UMR 5607 Ausonius (Presenting author)
Co-Author: Mr Comte, Florent - UMR 5607 Ausonius; Labex LaScArBx
Keywords: Late prehistory, methods,
Presentation Preference: Oral

In the archaeology of the Western Mediterranean Iron Age, agglomerations are often defined in an essentialist fashion: if an agglomeration meets certain criteria (presence of a fortification, size,nature of the inner building for instance), it will receive a label (hill-forts, oppida, proto-urban settlements...) aimed at categorizing it.
Such a formalist approach does not focus on the analysis of the social organization, but on the general aspects of the remains. The predominant type of architecture, the density of the settlement, the presence or absence of such or such structure (public building, sanctuaries...) are considered as the main keys bringing toward identification, classification of the settlement. One may argue that such an approach focuses exclusively on the aspect of the site at the end of the excavation process, thus implicitly considering that the function and the status of the agglomeration remained static through time. Moreover, this approach may be considered as teleological, in the sense that the whole historical trajectory of the agglomeration is analyzed through the lens of what it became at some specific moment of its occupation.
This paper offers to challenge such a point of view and to propose, through a case-study, new methods and new perspectives for studying Mediterranean Iron Age agglomerations. These have to be considered as the result of dynamic processes, commencing with the first occupation and ending at the moment of the excavation. The excavation of the hill-top settlement of Malvieu, inhabited from the Late Bronze Age to the end of the Early Iron age, provided the opportunity to experiment new approaches aimed at studying the agglomeration through three steps: morphogenesis (its "birth"), morphodynamics (its evolution through time) and processes of formation as an archaeological site.

13 MURO TENENTE: THE RISE AND FALL OF AN URBAN LANDSCAPE

Author: Professor Burgers, Gert-Jan - Free University Amsterdam
Co-Author: merlino, matteo - university of Amsterdam (Presenting author); kok-merlino, Raphaelle-Anne - university of amsterdam
Keywords: urbanization, spatial analysis
Presentation Preference: Oral

Muro Tenente, a Messapian settlement located in Southern Italy, lies at the core of research carried out by the Dutch Free University over the last 25 years and which holds today a prominent position among the on-going projects in Puglia. This site grew during the 4th and 3rd century BC, from a small settlement to a large oppidum of almost 52 hectares. Such a rapid expansion led to the construction of new city walls, which enclosed several neighbourhoods and a new series of monuments and central buildings. Demographic and political decline arrived just one century later, probably following the second Punic war and resulted in a clear downgrade of the site to a village with the abandonment of the city walls and the central buildings of the settlement. This rapid emergence and collapse of the urbanization phenomena represent a perfect case study for understanding the processes of definition of the urban space, seen particularly through the acquisition and reinterpretation of spatial models and the creation of landmarks. Furthermore, this settlement may shed new light into the processes which took place at the time of the downsizing of the city into, most likely, a secondary settlement. This paper will present the spatial archaeological data resulting from the exploration of the site and will discuss these results in relation to the social dynamics of Messapian societies during the Hellenistic period.

14 LANDSCAPE IMPACT OF LATE ANTIQUE AND MEDIEVAL TOWNS

Author: Dr. Schreg, Rainer - RGZM (Presenting author)
Keywords: urban_ecosystem, cultural_landscape, human_impact
Presentation Preference: Oral

Based on recent research in Iustiniana Prima (Caricin Grad, Serbia) and hillsites in Southwestern Crimea the paper will sketch the idea of urban ecosystems as a basis for a comparative approach.

15 THEORISING URBAN AGGLOMERATION IN PREDYNASTIC UPPER EGYPT USING AGENT BASED MODELING

Author: Nitschke, Jessica - University of Cape Town (Presenting author)
Keywords: Egypt, settlement, modeling
Presentation Preference: Oral

The archaeological record shows that from the period of ca. 4000 BC to 3500 BC, neolithic farming communities in Upper Egypt underwent a process of settlement agglomeration, leading to a system of multiple large urban centers surrounded by smaller satellite communities with increasing social complexity and inequality; so-called 'proto-states'. Out of these 'proto-states' a unified territorial state under dynastic rule encompassing the whole Nile Valley in Egypt eventually emerged by ca. 3100 BC. Exactly how and why the dynastic state emerged in Egypt when it did has been a subject of great debate amongst scholars for generations.

Recently, several scholars have set aside the search for a grand unified explanation for Egyptian state formation, acknowledging that the transformation from a system of relatively egalitarian farming communities to a large centralised territorial state with pronounced social hierarchy was the result of overlapping complex social, economic, geographic factors. However, archaeologists still struggle to adequately narrate and understand this process.

This paper will present what Agent Based Modeling—a type of computational simulation—can contribute to the discussion. While ABM has shown increased popularity amongst anthropologists, archaeologists, and historians in recent years in the study of emergent social-level phenomena, it is still relatively underused as a methodological tool by archaeologists. However, ABM potentially offers one of the most robust means of testing hypotheses about social and urban social change in the distant past against the empirical data. This paper will introduce some of the prevailing theories/models concerning the aggregation of villages and rise of polities in early predynastic Upper Egypt and show how ABM can be used to critically evaluate and refine these models. This will be done with reference to other case studies where ABM has successfully been used to model the emergence of social complexity and polity fusion/fission.

16 AGGLOMERATION AND ANTI-AGGLOMERATION: A DYNAMIC ARCHAEOLOGICAL PROBLEM

Author: Prof. Zubrow, Ezra B W - University at Buffalo and University of Toronto (Presenting author)
Keywords: Agglomeration, statistic, process
Presentation Preference: Poster

Agglomeration is an extension of a village or urban area central place to its contiguous areas by a variety of real and/or perceived links. It is dynamic both temporally and spatially. If one is to use agglomeration in archaeology one needs to consider how to measure agglomeration and the opposite process. .Historically, beginning with cluster techniques, measurement has progressed from simple indices of spatial inequality (e.g. Gini coefficient) to theoretically grounded measures, to nonparametric point based measures and most recently continuous measures. Such indices ideally should be 1) comparable across types of prehistoric cultures, 2) comparable when scalable, 3) unbiased regarding spatial and temporal classification, 4) controllable for overall activities, 5) have a statistical significance test, 6) be soluble, and 7) be justifiable by a suitable model. Anti-agglomeration also is a process that appears in the archaeological record. It may be measured by the Hausdorff and related statistics. This paper reviews the various reasons and measures for agglomeration and anti-agglomeration and suggests that they may be combined with time series, auto, and cross correlation. Simulated and real archaeological examples are analyzed with measurement preferences delineated.

17 WHAT MAKES THEM SPECIAL? A STATISTICAL APPROACH ON THE ROLE OF FORTIFIED URNFIELD CULTURE HILL-TOP SETTLEMENTS

Author: Girotto, Chiara G. M. - Goethe University Frankfurt (Presenting author)
Keywords: Urnfield, settlement, statistics
Presentation Preference: Oral

Hill-top settlements are often considered to be a 'central place' of general geopolitical importance, centres of trade, power and home to the elites. This concept of an evolutionary hierarchical society has often been interpreted as a continuous process, deeply rooted in the European Metal Ages.
This contribution presents a methodological approach to reconstruct the role of fortified hill-top settlements in the settlement pattern of Central Swabian Urnfield culture sites. It is based on a detailed analysis of sites (settlements, graves, hoards, single, and stray finds) in the region summarising the recovered material into functional groups (e.g. needle, bracelet) and categories (e.g. jewellery). Additionally the emergence of (fortified) hill-top settlements will be traced throughout the Bronze Age in order to gain insight into the general relations and potential patterns. This firm base allows statistical analysis to perform without a priori assumptions of the sites original function allowing to test e.g. for spatial auto-correlation, log-risk surfaces and self-organising algorithms in general. This wide array of methods will complement more traditional ones, like site mapping and kernel density estimates.
Only if a conclusive pattern can be established, interpretations of roles and temporal variations within these structures should be attempted. Advanced geospatial statistics in combination with archaeological markers will allow new insights into potential clustering factors and provide new determinates for the theoretical interpretation of these sites. The primary interest is whether there are any factors other than elevated geographic location, and (mainly undated) fortification, that allow the interpretation of fortified Urnfield hill-top settlements as 'central places' and these assumptions will be challenged and tested.

18 WAS THEBES REALLY NECESSARY: UNCERTAINTY IN SPATIAL MODELLING

Author: Dr Evans, Tim - Imperial College London (Presenting author)
Co-Author: Prof Rivers, Ray - Imperial College London
Keywords: Spatial modelling Greece
Presentation Preference: Oral

Regional interactions are an important aspect of settlement history and these alone may lead similar sites to follow very different historical trajectories. In this talk we will consider how models can provide one viewpoint of the role of spatial interactions in settlement evolution. We will illustrate the approach with the example used by Rihll and Wilson in 1979, that of the rise of central Greek cities in the ninth and eight century BC.

To understand settlement formation using models of spatial interactions various choices need to be made including site locations, site separations, and the functions which characterise the ease of travel between sites. Different choices will necessarily lead to different outputs and we can only proceed if modelling choices that are 'close' give outcomes that are similar. Where there are local differences it suggests that there was no compelling reason for one outcome rather than the other. If these differences are important for the historic record, we may interpret this as sensitivity to contingency.

In our work, we identify the sources of uncertainty for spatial modelling in general and show how to quantify their effect on results. For our example of Greek city states, we find some results are robust e.g. Athens does owe its position to a combination of geography and proximity to other sites. At the same time, we conclude that some of the earlier modelling results are not robust. Of these the rise of Thebes is the most contingent so suggesting that its success reflects social forces outside the grasp of simple spatial modelling.

This is a significant extension of preliminary work first presented at EAA Glasgow 2015 (Rivers & Evans, Frontiers in Digital Humanities, 2017, to appear).

19 IRON AGE AND EARLY MEDIEVAL CENTRES – ADVANTAGES AND PITFALLS OF A COMPARATIVE APPROACH

Author: Dr. Dresler, Petr - Department of Archaeology and Museology, Masaryk University (Presenting author)
Co-Author: Dr. Danielisova, Alzbeta - Institute of Archaeology CAS; Dr. Marik, Jan - Institute of Archaeology CAS
Keywords: Iron-Age-Early-Medieval, model-of-"urban"-evolution, comparative-approach
Presentation Preference: Oral

In this paper we attempt to explore development, role and function of the central places in the Iron Age and Early Medieval periods approaching this issue from different perspectives in order to test their comparative potential. Earlier approaches to protohistoric and early historic urbanisation phenomena implied distinct criteria to test whether the status of a settlement could be viewed as "urban". These criteria were either present or absent and within this binary framework the "urbanisation level" of a given site was evaluated. In reaction to these rather static models that neglected the effect of dynamics of urbanisation as well as their "non-urban" counterparts, the research cluster of the DAI developed an urbanisation-model with criteria that included "objectified and quantifiable values" (cf. Wendling 2013) such as: continuity and sustainability of settlement activities; the degree of social interaction and political communication; topographical and structural proximity of the built environment; functional and structural diversity of building structures; and

concentration and diversity of crafts, trade, and services. Using DAI concept as a basis, we slightly expanded the criteria and formulated weighted empirical model that was subsequently applied to selected Iron Age and Early Medieval "centres". With help of several case studies we intend to demonstrate that strength of a comparative approach lies especially in revealing the major development trends or principles of a long-durée nature (such as basic economic systems), while the risks of misinterpretation are associated chiefly with limited knowledge of social hierarchy, political strategies and cultural norms.

20 AGGLOMERATIONS AND THE ORGANIZATION OF URBAN PLANS

Author: Mr. Ehrlich, Simeon - Stanford University (Presenting author)
Keywords: urban form, cross-cultural
Presentation Preference: Oral

This paper argues that agglomerations are a more significant indicator of urban spatial organization than urban forms. Cities with similar urban forms (e.g., grid plans) may in fact be organized very differently in terms of the division and accessibility of space; thus, forms can be misleading. Studying agglomerations gives a much better sense of how space is divided and used with a city.

Through the morphological analysis of case studies from ancient and medieval contexts around the globe, this paper demonstrates how a variety of agglomerative forms (e.g., isolated buildings, orthogonal blocks, agglutinative masses) function in urban plans. By studying various quantifiable metrics of the agglomerations in each of these examples, this paper proposes a set of paradigms of urban spatial organization, centered on the underlying agglomerations around which the cities are structured.

By considering how similar organizations arise in disparate temporal, geographical, and cultural contexts, this paper prompts a reconsideration of whether urban forms are consciously chosen or arise in response to certain conditions at the time of planning. Moreover, approaching plans as compositions of agglomerations rather than as monolithic units serves as a more robust framework for the comparison of urban forms across cultures.

21 "SUBURBIA" REVISITED APPROACHES FROM CONTEMPORARY URBAN GEOGRAPHY APPLIED TO PAST AGGLOMERATIONS

Author: Dr. Röhl, Constanze - Römisch-Germanisches Zentralmuseum Mainz (Presenting author)
Keywords: Urban_Geography, Informal_Settlements, Late_Antiquity
Presentation Preference: Oral

Informal settlements - or 'slums' as they are most commonly being referred to despite the highly connotative value of the term – constitute a feature of contemporary urban geography worldwide. While being defined based on varying sets of characteristic traits accuring together, they all share the common denominator of showcasing architecture that was built without official approval of the respective governments. Despite this fact, it can not be neglected that they form an integral part of modern cityscapes, manifesting complex societal structures within spatially restricted boundaries. This paper will examine whether similar processes can be reconstructed for Antiquity. Based on previous work applying the Space Syntax Method, a complex of comparatively 'simple', mainly one-roomed structures outside the Acropolis of Byzantine Caricin Grad in southern Serbia will be revisited regarding the aspect of potentially exhibiting traits of a similar phenomenon. Albeit not presupposing the obvious impossibility of fully reconstructing intangible values within a very specific case of society in the Byzantine Empire, questions pertaining to the extent to which spatial relations might allow for this will be addressed.

22 SHARING PLACE – CREATING SPACE THOUGHTS ON PLACE MAKING AND CLUSTERED HOUSE REMAINS IN PREHISTORIC IRELAND

Author: Dr Bergh, Stefan - National University of Ireland Galway (Presenting author)
Keywords: roundhouse, place-making, prehistoric
Presentation Preference: Oral

The extensive and densely clustered group of round-house foundations on the cliff faced plateau at Mullaghfarna, Co. Sligo occupies a unique position in Irish Prehistory as an enigmatic, Neolithic/Bronze Age village with few counterparts on the island. Due to its location within the 'ritual landscape' of the Neolithic passage tombs complex of Carrowkeel/Keashcorran, the houses have long been assumed associated with the nearby passage tombs.
The first detailed survey of the site has recently been completed, recording some 165 round 'house foundations', 10 enclosures, as well as about 100 auxiliary area/spaces linked to the houses. Trial excavations in three of the houses have returned Neolithic as well as Bronze Age dates.
The house foundations show a wide variation both in size and construction complexity and seem to represent a highly dynamic and intricate use of the very limited space on the dramatic plateau,
Based on this large and tightly clustered group of 'domestic remains' this paper will discuss aspects of place making and agglomerated house remains in social and ritual terms; but also the implications of agglomerated settlement patterns in relation to the more traditional distribution of domestic life in the Neolithic/Bronze Age.

23 AGGLOMERATION, SOCIAL PRACTICES AND THE BUILDING OF COMMUNITY AMONG COASTAL HUNTER-GATHERERS FROM THE ATACAMA DESERT

Author: salazar, diego - Universidad de Chile (Presenting author)
Co-Author: andrade, pedro - universidad de concepcion; flores, carola - Proyecto Fondecyt 1151203; olguin, laura - proyecto fondecyt 1151203; borie, cesar - proyecto fondecyt 1151203
Keywords: hunter-gatherers, agglomeration, community,
Presentation Preference: Oral

The Middle Holocene in the coastal Atacama Desert in what is today northern Chile witnessed a regional process of decreased residential mobility and agglomeration of marine hunter-gatherers. In this paper we analyze the historical trajectory leading from highly mobile and low demographic groups to semipermanent occupations of bigger groups in dense shellmiddens, with no evidence of significant changes in technologies. We will discuss the environmental context associated with this transformation, but will especially address the process from a social perspective, interpreting these changes as processes through which hunting-gathering-fishing bands built a sense of community and social identity through the use of space, the social practices enacted at those spaces and the deliberate differentiation with other coastal groups.

270 THE ARCHAEOLOGY OF EUROPEAN MIGRATION IN THE EARLY MODERN PERIOD

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Murphy, Eileen (United Kingdom) - Queen's University Belfast
Co-Author(s): Donnelly, Colm (United Kingdom) - Queen's University BelfastGeber, Jonny (New Zealand) - University of Otago
Keywords: European migration, Early modern, mobility
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Europe is currently caught in a migrant crisis, with an estimated 30 million non-Europeans currently living in the continent. The media is filled with discussion on how these newcomers will alter the European way of life, with perceived notions of soaring migration rates one of the key factors behind the UK's Brexit decision. The forces at work leading to this migrant movement into Europe, however, should be familiar with anyone cognisant of the factors that led to mass migration of Europeans in the period from the 17th century to the 20th century – economic deprivation, and escape from religious, racial and political intolerance and persecution. Migration has long been debated by archaeologists as a force for social and economic change in prehistoric and medieval times, but the history of Early Modern Europe demonstrates that an estimated 60 million Europeans emigrated from their homelands between 1815 and 1920, primarily to the Americas, Australia and Africa in a process that continued for some European countries into the 1960s and 1970s. But what was the impact – if any – that these European immigrants brought to the lands to which they moved? Did they materially change the host nation significantly? Did they change the underlying social norms and customs? Can an archaeological methodology help us to understand these processes and, by extension, help bring perspective to events in early 21st century Europe? The session is sponsored by the European Journal of Archaeology.

01 AN OVERVIEW OF MIGRATION THEORY IN ARCHAEOLOGY

Author: Mr McSparron, Cormac - Centre for Archaeological Fieldwork, Queen\'s University Belfast (Presenting author)
Keywords: Migration Theory
Presentation Preference: Oral

Until the rise of the "New Archaeology" of the 1960s it had been the case that migration was widely accepted as the primary motive for cultural change in the archaeological record over time. Influenced by the functionalism of Anthropology, the significance of migration subsequently became downplayed, if not indeed somewhat discredited since it could be seen as being a facilitator for the creation of national – and nationalist – myth-making. The importance of migration in the modern world, however, cannot be understated, and if we wish to better understand today's migrations and their associated ramifications on host societies and regions then the best place to commence that process is with our knowledge of past historic migrations. Since the 1990's new theoretical frameworks for studying migration have been created. Central to these is a realisation that migration is not a series of time-confined events, and nor is it necessarily embedded with Imperial colonisation ventures. The importance of pioneer communities, streams of migration and the returning migrant are all now recognised as being key elements in the process, while material culture has been shown to be differentially affected by migration. Types of activities, such as personal home life, leisure, and some aspects of ritual activity have been singled out as those likely to retain aspects of the material culture and symbolism of the immigrant homeland in contrast to subsistence or economic activity which are most likely to be adapted or changed. The lecture will be informed by what we can learn from European migrations of the period from 1600 to 1900.

02 EUROPEAN PRESENCE IN TAIWAN IN THE 17TH CENTURY: THE COLONY OF SAN SALVADOR DE KELANG

Author: Dr Cruz Berrocal, Maria - Zukunftskolleg/Dept. of History and Sociology (Presenting author)
Co-Author: Dr. Gonzalez, Antonio - Universidad Complutense de Madrid; Dr. Valentin, Frederique - CNRS/UMR 7041 ArScAn M
Keywords: Taiwan, colonialism, burials
Presentation Preference: Oral

An ongoing international archaeological project on the location of the former European colony of San Salvador de Kelang in present-day Keelung, northern Taiwan, has unearthed in the last years burials probably belonging to the cemetery associated with the church built by the Spanish after the foundation of the colony in 1626. In this paper we will describe the burials, human remains, and ongoing analysis, as well as the historical context that explains this early European presence in Taiwan. So far, these skeletal remains appear to be the oldest European remains in Asia-Pacific yet uncovered.

03 IN DEFENSE OF DENMARK. MIGRANT CRISIS AND CONFLICT IN 17TH CENTURY DENMARK

Author: Curator Linaa, Jette - Moesgard Museum (Presenting author)
Keywords: migration mobility conflict
Presentation Preference: Oral

In the present Denmark is deeply troubled by migration, but this situation is nothing new. The national self-image of Denmark as a small and peaceloving nation has been shattered by recent research projects, that demonstrate our past as a time of conflict and unrest. The unrest peaked in the 16th and 17th century, where masses of migrants; most of them political and relisious refugees, settled in our cities. A large number settled in the Danish city of Helsingør, turning the city into the wealthiest and most cosmopolitan city in the realm of Denmark. But this came at a price. The migrants turned the city into a multi-cultural and multi-religious environment with the economic and social power concentrated among the migrant groups, mutch to the disadvantage of the indigenous Danes. This development rendered the IDanes de facto powerless in a city they felt was rightfully theirs. Feelings of resentment and anger towards the migrants developed among the locals, and occasionally deliberate acts of provocation fromone group towards another left the city on the brink of ethnic violence. This paper evolves around an incidence of an incredibly provocative nature: an incidence, that could have ended in ethnic violence in the city, but didn't. How such a volatile situation was defused is a lerning piece for us all. The paper takes its starting point in the transnational and transdisciplinary research project Urban Diaspora, aimed at a study of migration in our recent past.

04 TO GREENER FIELDS? REVEALING LIFE STORIES THROUGH OSTEOBIOGRAPHIES OF 19TH-CENTURY EUROPEAN MIGRANTS TO SOUTHERN NEW ZEALAND.

Author: Dr Geber, Jonny - University of Otago (Presenting author)
Co-Author: Prof Buckley, Hallie - University of Otago; Dr Petchey, Peter - University of Otago
Keywords: Australasia, immigration, settlers
Presentation Preference: Oral

The European settlement of New Zealand began in the late 18th century, with intense colonial settlement occurring in the middle of the 19th century. During this period the southern part of the country, Otago, saw an explosion of immigration, from many European countries and America and China in response to the discovery of gold. Agricultural development and incipient urbanisation started to develop soon after this, supporting the gold rush and other European populations. Until recently, bioarchaeological research into this period of New Zealand history was essentially non-existent. This paper will outline the development of a research project on European Historic cemeteries, starting with the St John's Anglican cemetery in Milton, South Otago. Excavation of the cemetery in late 2016 found 25 individuals from 28 burials of infants, children and adults. Part of the discoveries of this project was the positive identification of people from the preserved painting on top of the coffin lids. These identified people were first generation immigrants from mainland Europe and the United Kingdom. Two individuals, buried side by side, were husband and wife. We will outline the social history, from historical records, of this married couple, their coffin furniture and the osteological profiles we have compiled. These data will be discussed within the New Zealand colonial context and the global environment from which they came.

05 'THE CHERUB HASTENED TO ITS NATIVE HOME' – MEMORIALS FOR AN IRISH IMMIGRANT COMMUNITY IN EARLY NINETEENTH-CENTURY LOWELL, MASSACHUSETTS

Author: Dr Murphy, Eileen - Queen's University Belfast (Presenting author)
Co-Author: Mr McKean, Dave - St Patrick's Parish and Cemetery, Lowell, Massachusetts; Dr McKerr, Lynne - Queen's University Belfast
Keywords: memorials, Irish, Massachusetts
Presentation Preference: Oral

The opening of St Patrick's Church in July 1831 is a testimony to the major impact that Irish Catholic immigrants had on Lowell in the early nineteenth century. The burial ground associated with the church is a rich resource of information about the first generations of Irish in this industrial town. The cemetery's slate memorials are particularly well preserved and provide a wealth of information concerning demography and origins, and the following paper will focus on the information recorded in these memorials. The nature of the epitaphs and associated symbolism will be explored and compared to contemporary data from the adjacent 'Yankee' cemetery as well as burial grounds in Ireland. This approach will enable us to explore whether or not the Irish Catholics of Lowell had a different attitude towards the commemoration of their dead in comparison to their Protestant neighbours and Catholics in their home country. We will also investigate evidence of Irish ethnicity that can be identified on the memorials and explore features that help to indicate the immigrant status of the population. Were the headstones in St Patrick's used as a means of enabling the settlers to develop new family histories for themselves in Lowell – removed from Ireland – and to establish themselves as a community in this Massachusetts town?

06 TRANSATLANTIC EXCAVATIONS: EXPLORING THE STORY OF THE EARLY 19TH-CENTURY IRISH SETTLERS IN LOWELL, MASSACHUSETTS, USA

Author: Dr Donnelly, Colm - Queen\'s University Belfast (Presenting author)
Keywords: settlement, Irish, Massachusetts
Presentation Preference: 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 Cummiskey, 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; historical research has demonstrated that many of these early Irish settlers were from County Tyrone – in particular, the area around Trillick and Dromore – in the north of Ireland. A research project was developed by the Center for Irish Partnerships at the University of Massachusetts Lowell and the Centre for Archaeological Fieldwork at Queen's University Belfast to investigate this transatlantic relationship with a programme of excavation undertaken in the heart of the Acre on the lawn outside St Patrick's Church on Suffolk Street, and at the Cummiskey homestead, an abandoned rural cottage on the outskirts of Dromore. With the objective to further our knowledge and understanding of life for the Irish emigrants in 19th-century Massachusetts, and the life of the Irish in 19th-century Tyrone, the lecture provides an overview of what has been achieved to date.

07 NAVIGATING CONTACT: EUROPEAN COLONIALISM, ARTISTIC INNOVATION AND THE MAINTENANCE OF INDIGENOUS AUSTRALIAN CULTURE

Author: Dr. Frieman, Catherine - Australian National University
Co-Author: Dr. May, Sally K. - Griffith University (Presenting author)
Keywords: Contact, rock art
Presentation Preference: Oral

In recent years rock art has emerged as a key tool for archaeological studies of interaction during the early Australian contact between Aboriginal Australians and newcomers to their shores. Thanks to a growing body of research focusing on contact period rock art in Australia, we are now at a point where we can see emerging themes at local and even national levels. Yet, we would argue that there is great potential for further critical or interpretative investigation of this body of rock art with little attention paid to the evident innovations in style, technique or subject matter and their connections to or reflections of shifting social relationships within Aboriginal society or between artists and their artistic traditions during the process of colonial contact as well as between Aboriginal people and newcomers to their land. In this paper, we look at the ways in which contact period rock art encapsulates and expresses the tension between Tradition and Innovation in Australia in order to interrogate the ways in which innovation both impacted upon and was used by Indigenous groups to navigate contact with European migrants, their society, material culture and technology.

271 MAPPING OUR HERITAGE: TOWARDS A SUSTAINABLE FUTURE FOR DIGITAL SPATIAL INFORMATION AND TECHNOLOGIES IN ARCHAEOLOGICAL HERITAGE MANAGEMENT

Theme: 2. The Valletta Convention: the next 25 years
Author: Verhagen, Philip (Netherlands) - Vrije Universiteit Amsterdam
Co-Author(s): Van Manen, Niels (Netherlands) - Vrije Universiteit AmsterdamBernard, Loup (France) - Université de Strasbourg; UMR 7044 ArcHiMedEHuvila, Isto (Sweden) - University of Uppsala
Keywords: spatial technology, heritage management, sustainability
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The enormous increase in digital spatial information has led archaeologists all over Europe to rely ever more on digital data to prepare and carry out archaeological research, both in academic and heritage management contexts. Spatial information, collected by archaeologists since the implementation of the Valletta Convention, is increasingly used to guide heritage management policies, from urban design to rural planning and tourism, for example through geo-design. Furthermore, spatial information is more and more employed to involve the general public, using digital technologies in museums and other places of archaeological interest, but also to involve amateur archaeologists in data collection programmes using crowdsourcing.

Issues of sustainability of digital data repositories, accessibility and reliability of data, standardization of data formats and management of property rights are currently widely debated inside and outside archaeology, but have not yet led to generally accepted practices of data management across or even within European countries. The development of appropriate tools to access and present relevant spatial information to heritage managers and general public is still very much in the stage of exploration, focusing mainly on project-specific contexts, often with a short life-span. Both aspects however are crucial for the sustained use of spatial data in European archaeological heritage management over the next decades. In this session we want to invite papers that present solutions and reflections on how to develop sustainable approaches and technologies for management and use of spatial data in archaeological heritage management, and in broader contexts of planning, design and public involvement.

01 'CHARACTERFUL' DATA: EMBRACING THE COMPLEXITY IN ARCHAEOLOGICAL INFORMATION

Author: Dr Green, Chris - University of Oxford (Presenting author)
Co-Author: Dr Cooper, Anwen - University of Manchester
Keywords: Valletta, Data, Complexity
Presentation Preference: Oral

Archaeologists regularly bemoan the complexities and lack of coherence of our datasets, a perceived problem that has only become more and more important following the explosion of data following the establishment in the 1990s of principles around preservation by record of heritage assets impacted by development (most notably represented by the Valletta Treaty of 1992 in Europe). We often tend to think that this is a problem that is particularly acute to archaeology and heritage management, but our survey of the relevant literature from other disciplines proves that this is not the case (Cooper & Green 2016). Instead of hand wringing over problematic or 'dirty' data, we instead suggest that we as archaeologists should embrace the varied and complicated character of our datasets in a more positive fashion. In particular, we recommend the application of scale-dependent computer methodologies that vary in their precision / resolution depending upon the spatial / temporal / typological scale of analysis undertaken and, as such, reconfigure some of the problems of dealing with data duplication and disparity.

References:
Cooper, A., and C. Green. 2016. 'Embracing the Complexities of "Big Data" in Archaeology: The Case of the English Landscape and Identities Project.' Journal of Archaeological Method and Theory 23: 271–304. doi:10.1007/s10816-015-9240-4.

02 AND WHAT THE LAND DEVELOPERS THINK ABOUT SPATIAL INFORMATION?

Author: Prof. Huvila, Isto - Uppsala University (Presenting author)
Keywords: development, information, needs
Presentation Preference: Oral

Archaeological spatial information have many stakeholders in society. Although the developers tend to be only indirectly involved in the actual archaeological fieldwork, archaeological spatial information is of direct relevance to their work. Even if the role of developers have been touched upon in the earlier literature, there is little empirical research on their perspectives to archaeological process, their information needs, and how they use and value information produced and provided by archaeologists. On the basis of a review of international literature and an empirical survey study conducted in Finland and Sweden, the presentation reports land developers' needs of and perspectives to archaeological spatial information, its availability and usefulness in the context of their work. In addition, the presentation discusses the implications of land developers' perspectives to the production and management of archaeological information.

03 KNOWLEDGE EXTRACTION FROM AN ABUNDANCE OF SOURCES: STRUCTURING THE NATIONAL DATA REPOSITORY FOR ARCHAEOLOGICAL DATA

Author: MA Van 't Veer, Rein - Vrije Universiteit Amsterdam (Presenting author)
Keywords: tables, structuring, semantics
Presentation Preference: Oral

Shortly after the implementation of the Valletta treaty, the Netherlands have created a national repository for archaeological data, for which transfer of data from any project executed in the context of the Valletta treaty is mandatory. Data Archiving and Networked Services (DANS), part of the Royal Netherlands Academy of Arts and Sciences (KNAW), has taken up this important task. However, only recently a national standard for exchange of digital information has started to take shape. The 'legacy' data that has now filled

close to 27,000 submitted projects at DANS, is therefore largely un- or at most semi-structured. Structuring this data is paramount for those wanting to use the national repository as an integrated database, to search for specific artefact types, archaeological structures or feature types.

This structuring operation must scale to 150,000 CSV tables, over perhaps as much as 2,500 source schemas. Data models vary not only from organisation to organisation, but also in respect to project types, sometimes even from project to project, resulting in high data variability. The tabular data is commonly collected in the field and office through databases, spreadsheets and geospatial data tables. Data tables originating from tabular sources are converted by DANS to CSV. GIS files are transformed a format readable by geospatial file parsers, compatible with a CSV format. In a nutshell: all tabular data can be converted into CSV. CSV files can be easily analyzed in terms of their underlying schema.

These schemas can be leveraged to create a structure. Each schema is analysed and matched to one as its closest neighbour. From neighbouring or parent/child derived relationships, descriptions, models and vocabulary mappings can be inherited to transform the multitude of sources to a handful of semantically rich and well-described types, ready for use in a search application.

04 HISTORIC ENVIRONMENT SPATIAL DATA DISCOVERY IN SCOTLAND

Author: Mr McKeague, Peter - Historic Environment Scotland (Presenting author)
Keywords: Spatial Data, Archives
Presentation Preference: Oral

Through a range of legal requirements there is an ever-increasing expectation for remote access to high-quality information about the historic environment to support decision-making processes and for wider interest. In Scotland, both the INSPIRE Directive and the Open Data Strategy encourage the release of data from public sector organisations and are key components in helping deliver the Scottish Government's vision for a world-class digital economy by 2020.
Under INSPIRE, Historic Environment Scotland (HES) publishes a range of spatial datasets, including both formally designated Scheduled Monuments and non-statutory data held in the National Record of the Historic Environment (https://Canmore.org.uk) under the Protected Sites theme. HES works closely with local authority Historic Environment Records and others, to help deliver the Scottish Historic Environment Data Strategy (SHED). Data custodians are encouraged to publish their key data online through PastMap (http://pastmap.org.uk).

HES also champions the need for a thematic Spatial Data Infrastructure to harness the wealth of primary digital data to enable more effective appreciation and management of the historic environment. Online forms help standardise the reporting of a range of fieldwork activities, including capturing technical metadata for a range of remote sensing techniques whilst adoption of Preservica software helps ensure the long-term preservation of digital data deposited in the HES archives. However, systematically harnessing the value of the spatial components from primary datasets remains elusive.
Contrasting the availability of mandated datasets under INSPIRE with the need to collate, preserve and share primary data highlights the need to develop a framework for the coordination of spatial data from across the historic environment to help deliver the many benefits of the digital economy.

05 ARKEOGIS, LINKING MULTILINGUAL DATASETS OF SPATIALIZED DATA ONLINE

Author: Dr Bernard, Loup - Université de Strasbourg; CNRS UMR 7044 ArchiMedE (Presenting author)
Keywords: GIS LOD spatial
Presentation Preference: Oral

The fourth version of ArkeoGIS is an effective online solution for sharing spatialized data about the past. This paper will emphasize on the latest evolutions of this specific project, but also describe some good practices that appear effective for international online data sharing. ArkeoGIS was created as a bottom-up project in a boarder-region, with French and German archaeologists –both academic and heritage professionals- and also has a strong link to palaeoenvironmental studies.
It appears that the varieties of tools developed in the past decades are essential cannot be replaced by a single repository, and that linking our tools seems to be the most effective solution for archaeologists to have access to data. Considering the competitive environment of work - for research as for companies- The need of sustainable (CNRS hosted), costless for the professional users, multilingual tools of this kind appear to be an easy and effective solution.

06 TOMORROW'S ARCHAEOLOY : A SPATIAL DATA INFRASTRUCTURE FOR SUSTAINING AND SHARING DATA IN PREVENTIVE ARCHAEOLOGY

Author: Dr Anne, Moreau - INRAP - National Institute for Preventive Archaeological Research (Presenting author)
Keywords: spatial data infrastructure
Presentation Preference: Oral

In 2011, the French National Institute for Preventive Archaeological Research started systematizing the use of GIS to the scale of the operation whatever the type of digging. The systematization of GIS allows the constitution of a "catalogue of the spatial data". This catalogue aims at easing access to the data produced in order to prepare upcoming operations and offer a catalogue of the primary data for the researchers. It is also a way of archiving data and providing data for reuse.

In order to guide the archaeologists in the use of GIS and to make the catalogue of spatial data real, it has first been necessary to define standards of primary spatial data. Six minimum layers have been defined. The first four layers of each operation (perimeter, opening and archaeological remains) are gathered in a PostGIS-PostgreSQL server. They constitute the main spatial data of the catalogue considered as the key level of neutral and interoperable archaeological data. Linked to the digital library of the institute and soon, to the archives of each operation, it represents a programmatic framework for the implementation of a Spatial Data Infrastructure within the daily work of the Institute.

This infrastructure could offer different levels of access to data, from a full open access to simplified data for the general public, to the download level limited to professionnals. The existence of such a device would involve a redefinition of the part of future contributors according to a collaborative approach.

Sharing the data using a spatial data infrastructure is a way of promoting the reconciliation of scientific, patrimonial and socio-economic aims in providing primary data for several uses and users. It includes developers, researchers, cultural heritage community and the general public, to develop an awareness in public opinion of the value of the archaeological heritage.

07 OPEN ACCESS TO THE PAST – THE AFRICAN ARCHAEOLOGY ARCHIVE COLOGNE

Author: Dr. Jesse, Friederike - Universität zu KölnWilmeroth, Joana - Universität zu Köln
Co-Author: Mr Fäder, Eymard - University of Cologne - Institute for Prehistoric Archaeology (Presenting author)
Keywords: African Archaeology open access digital archive
Presentation Preference: Oral

For more than 50 years the African Archaeology at the University of Cologne has conducted field research in various parts of Africa, particularly in the Eastern Sahara and in Namibia. The focus was on environmental history and on rock art, with internationally renowned projects such as B.O.S. (Settlement History of the Eastern Sahara), ACACIA (Arid Climate Adaptation and Cultural Innovation in Africa) and "Rock Paintings of the Upper Brandberg".
Since most of the materials accumulated are not digital in origin, the African Archaeology Archive Cologne (AAArC) has endeavoured to digitize the archives and documentation available at Cologne University's African Archaeology and has made them digitally accessible. In collaborating with the DAI (German Archaeological Institute) infrastructure, AAArC is part of the iDAI-world and provides web-access to thousands of fieldwork documentations, pictures and tracings of rock art. Among them the entire catalogue of >500 sites documented in the Eastern Sahara by the B.O.S. project in the 1980s as well as the rock art data of the Brandberg, Namibia, tabulating >39,000 rock art figures.
In AAArC, open access interoperability of metadata integrated into picture formats is ensured. The task of establishing database management systems of highly varied structure in a digital repository that is based on open-source digital infrastructure is currently achieved through collaboration with IANUS (Research Data Centre Archaeology & Ancient Studies), a national, long-term preservation, digital archive for archaeological and related data.
AAArC offers participation in digital heritage content management, thus perpetuating the long lasting cooperation of Cologne's African Archaeology with a variety of African countries. AAArC aspires to make the full range of archaeological documentation accessible and not just pictures. Ultimately, AAArC enables a digital homecoming of complex research data to their countries of origin.

08 MAPMAKING IN THE NETHERLANDS: HOW TO SET A NATIONAL STANDARD?

Author: Mr Sueur, Chris - Buro de Brug (Presenting author)
Keywords: Maps, qyality, standards
Presentation Preference: Oral

Mapping the archaeological 'expectation' of a landscape is a formal part of our heritage evaluation policy/system. The local government is forced by the Dutch heritage law to incorporate these archaeological maps in their land use plans. An outsider would say: so far, so good.

At the implementation of the Malta principles into our legislation, we transformed archaeology at the same time from a state affair to a privately run business. For the complete archaeological process we set a quality standard: for desktop assessments, coring and sampling, trails pits, excavations and so on. However, we forgot to set a standard for the archaeological expectation maps. As a result, archaeological maps differ among each other, and there is a lack of acceptance with the farmers and property developers. Recently members of the Lower House questioned our maps and asked for improvements. Furthermore, a study carried out on behalf of the Dutch State Service for the Cultural Heritage, has confirmed major and undesirable differences within the archaeological maps of two neighbouring counties. Therefore time is now to take action. In January 2017 all responsibles for the production of archaeological map met and agreed to set a national standard as soon as possible, whether it is a scientific guideline or a best practice.
This paper aims to present an overview of the process of quantifying the quality of our archaeological maps in the Netherlands. Maybe this project in not completed at the time the EAA conference starts, but it can be a help to others dealing with the same problems.

272 CONSTRUCTION ECONOMIES OF THE PAST. NEW APPROACHES TO THEIR SOCIETAL, POLITICAL AND LONG-TERM IMPACT

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Brysbaert, Ann (Netherlands) - Leiden University
Co-Author(s): Gutierrez Garcia-M, Anna (France) - University of Bordeaux-Montaigne
Keywords: architecture, economy, cross-cultural comparison, multi-disciplinary
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Our 21st century construction industry links largely to economic growth by its scale and its driving force, and, inevitably, it has a serious impact on the global economy. Requiring financial investment already during design stages, all construction processes are labour-intensive, provide jobs, and can lead to an increasing quality of life and buying power.
In past pre-industrial societies whenever large-scale building projects took place, extensive manual labour was invested from the moment materials were scouted for, extracted, transported, employed and subsequently maintained. Since most pre-industrial societies were subsistence societies, important decision-making was a daily balancing act between building work and agriculture.
This session collects widely ranging papers, covering archaeological, experimental, historical and ethnographic/anthropological perspectives. These address the socio-economic and political decision-making needed for construction projects to materialize in many different past contexts. We aim to contribute responses to the following questions:
1-How were large-scale buildings constructed from both a material and a logistical perspective, how can we document this?
2-How and why were these buildings subsequently used by the various groups?
3-What levels of investment, human and other, were needed to achieve and sustain these constructions?
4-How can we measure these investments and employ these results meaningfully (for what?)?
5-Which sources of data are useful to approach both socio-economic and political issues involved in constructing?
6-Given that construction took place diachronically and geographically more or less worldwide, can we recognise common denominators, and which are these? How can multidisciplinary approaches further this research?

01 ON THE ROAD AGAIN. THE IMPACT OF TRANSPORT LOGISTICS AND INFRASTRUCTURE IN MONUMENTAL BUILDING EFFORTS

Author: Dr. Brysbaert, Ann - Leiden University (Presenting author)
Keywords: Greece, transport logistics
Presentation Preference: Oral

The question as to how large-scale buildings were constructed from both a material and a logistical perspective is central in this introduction paper which will focus specifically on transport issues in Late Bronze Age Greece. In past pre-industrial societies whenever large-scale building projects took place, extensive manual labour was invested from the moment materials were scouted for, extracted, transported, employed and subsequently maintained in the upkeep of the building complex and its subsequent modifications. Specific case studies in which these modifications were substantial enough to continue to mobilise relatively large or specific workforces will be presented. However, since most pre-industrial societies were subsistence societies, important decision-making relating to engaging such resources again and again had to be a daily balancing act between building work and agriculture. Specifically, the logistics needed to set up the infrastructure to transporting the construction materials as part of the building processes, and how these link to other essential spheres of life, impacted the involved resources to an important degree in which common denominators may be recognised diachronically and geographically. While the economic demands of transport were often high in the highlighted examples, they were nevertheless considered viable from a socio-political viewpoint. The balancing act between building and subsistence activities needs to be seen, therefore, in its wider context.

02 AN EXPERIMENTAL APPROACH TOWARDS UNDERSTANDING THE CHAÎNE OPÉRATOIRE OF HOUSE CONSTRUCTION: A NEOLITHIC EXAMPLE

Author: Professor Dr van Gijn, Annelou - Faculty of Archaeology, Leiden University (Presenting author)
Keywords: experiments, houseconstruction, toolkits
Presentation Preference: Oral

Experimental house construction provides a practice-based approach to obtain insight into the material properties and quantities of building materials, the variety of tools involved and their efficacy for specific building tasks. The amount of labour and skills required, and the organization of the entire process through time can also be investigated by means of a quantitative experimental program.
In 2012 and again in 2015/2016 we made a reconstruction of the Late Neolithic houseplan excavated at the Vlaardingen site of Haamstede-Brabers, in the province of Zeeland (NL). We only used replicas of Stone Age tools, including for example stone, bone and antler axes and adzes, wooden digging sticks and bone and antler chisels. The entire process was documented on film and photo and the amount of building materials, labour input, duration of tool use and the time different stages of the building process required, were quantified. The tools were subsequently studied for the presence of traces of wear to examine the potential visibility of house construction techniques in the archaeological record.
The fact that we were given the opportunity to repeat the experiment and construct the same house again in 2015/16 allowed us to learn from our mistakes and experiences of the first house and to make different technological choices. These different choices resulted in changes in the quantity of building materials used for both houses. The application of different techniques also required different labour input. In this paper these differences between the complete chaîne opératoire (i.e. labour, materials, tools, techniques) of the two house reconstructions will be compared, touching also upon the durability of the houses and the consequent taphonomic implications.

03 LABOUR INVESTMENT AND SOCIAL CHANGE: THE CASE OF THE NORTH CEMETERY AT AYIOS VASILIOS, GREECE

Author: Prof Dr Voutsaki, Sofia - Groningen Institute of Archaeology; Faculty of Arts, University of Groningen (Presenting author)
Co-Author: Mr Van den Beld, Youp - Groningen Institute of Archaeology; Mr De Raaff, Yannick - Groningen Institute of Archaeology
Keywords: labour, construction, change
Presentation Preference: Oral

In this session we are asked to reflect on human investment in large-scale constructions, to find ways to measure labour input, and to discuss the impact of building projects on economic and social relations.
While the emphasis in the session will inevitably be on monumental structures, we propose to pay attention also to more modest construction projects, especially those carried out in periods of rapid change when the division of labour and the circulation of resources undergo radical change. In fact, we would like to argue that the initiation of building projects is an important component in the transformation of reciprocal, segmentary, kin-based social networks to asymmetrical, centralized and competitive political entities . Our discussion will be based on the Early Mycenaean (1700-1450 BC) cemetery at Ayios Vasilios, southern Greece, which predates the Mycenaean palace on the same site. The Early Mycenaean period witnesses pervasive changes, expressed mostly in the mortuary practices: Extramural, formal cemeteries replace intramural burials; larger, deeper, and more complex built tombs replace simple cists and pits; multiple graves replace earlier single inhumations; richer offerings accompany the dead. It is generally accepted that these changes are part and parcel of the transformation of the mainland societies , i.e. the emergence of social asymmetries and political hierarchies. In this paper, we will focus on a) evidence for the arrangement of the cemetery area through the removal and heaping of soil and the construction of a platform, and b) variation in the size and construction of the tombs. Indeed the tombs in this period show substantial labour input used for the quarrying, transporting and rough working of different types of stone. Our aim is to reconstruct the labour input in the tombs and the cemetery as a whole, and to attempt to reconstruct changing social and kin relations.

04 CONSTRUCTION COSTS OF PRIVATE HOUSING IN ATTICA IN THE CLASSICAL PERIOD

Author: Dr Pakkanen, Jari - Finnish Institute at Athens and Royal Holloway, Univ. of London (Presenting author)
Keywords: construction, econometrics, Greece
Presentation Preference: Oral

The presentation will evaluate the potential of different types of source materials in estimating the construction costs of private housing in Late Classical Athens and Attica. The main categories are archaeological data, ancient building accounts, other textual sources and modern ethnographical data. Even though the cost of an individual house was limited, the joint effect of constructing the housing in large cities was significant and often larger than single monumental building programmes. The ancient house remains in Attica are often covered by the dense modern urban housing, so the archaeological data is highly fragmentary. However, the insulae in Classical Piraeus follow a strict grid plan, so even the meagre excavated remains are sufficient for a sufficiently reliable reconstruction of a typical block. In addition, the property prices of a number of houses sold in the fourth century were inscribed on stone, as were a large range of building accounts on monumental construction projects in the Greek world. The presentation will propose a model how the supply of building materials and the construction process of a small-scale private Greek building project can be calculated. Econometric quantification of building projects can provide more reliable foundations for future considerations of the economic and social importance of construction and maintenance of private housing. The case

study will concentrate on a reconstructed city block of eight houses in Classical Piraeus. The work-rate estimates used in the presentation are based on a range of different sources and their values can be cross-checked, allowing for more reliable econometric calculations.

05 THE CONSTRUCTION PROCESS OF THE REPUBLICAN CITY WALLS OF AQUILEIA: A CASE STUDY OF QUANTITATIVE ANALYSIS ON ANCIENT BUILDINGS

Author: Miss Previato, Caterina - Università degli studi di Padova, Dipartimento dei Beni Culturali: Archeologia, Storia dell'Arte, del Cinema e della Musica (Presenting author)
Co-Author: Mr Bonetto, Jacopo - Università degli studi di Padova, Dipartimento dei Beni Culturali: Archeologia, Storia dell'Arte, del Cinema e della Musica
Keywords: Aquileia, walls, construction
Presentation Preference: Oral

This paper aims at considering with new perspectives the city walls of the Latin colony of Aquileia, which is one of the most well-preserved architectural complexes dating back to the earliest period of life of the colony founded by the Romans in 181 BC as a strategic military bulwark, which soon became the most important and the richest city of Northern Italy. The defensive walls of the ancient town, built soon after the foundation of the colony, were 3 kilometres long and encircled an area of 40 hectares. They were provided with gates and towers, and were almost entirely made of fired bricks connected by thin lime mortar joints. In the foundations of the walls, also stone blocks and concrete enriched by pozzolanic ash was employed. By means of data collected during recent archaeological excavations and of data obtained by experimental analyses, we will analyse the different steps of the construction process of the city walls of Aquileia, trying to quantify the amount of building materials employed in the walls (bricks, stones, concrete), the time and the means of the supply and production of building materials, the number of workers involved and the time required by the building activity. The results obtained will be used to define the socio-economic impact of the construction process, and to analyse it in view of the historical context in which it took place, that is the period of the Roman conquest of Northern Italy, but also to test the overall strengths and weaknesses of quantitative analyses on ancient buildings.

06 LARGE-SCALE BUILDING IN EARLY IMPERIAL TARRACO (TARRAGONA, SPAIN) AND THE DYNAMICS BEHIND THE CREATION OF A ROMAN PROVINCIAL CAPITAL LANDSCAPE

Author: Dr Gutierrez Garcia-M., Anna - IRAMAT-CRP2A UMR 5060 CNRS -Université Bordeaux Montaigne (Presenting author)
Co-Author: Dr Vinci, Serena - Ausonius UMR 5607 CNRS - Université Bordeaux Montaigne
Keywords: Roman construction economics
Presentation Preference: Oral

In Early Imperial age, the Roman town of Tarraco (modern Tarragona, Spain), capital city of the largest Roman province in the Western Mediterranean, experienced an intense building activity that totally modified its architecture and urbanism. From the Augustan period -in the turn of the era- to the Flavian period - late 1st c. AD-, when the works of the Provincial Forum were completed, the landscape of the town was modelled reaching a degree of monumentality according to its political status.
The dual nature of the town, as colony and head of the province, meant that two public areas where developed: one as center of the Republican and Augustan colony, located in its lower part, and one on the upper part, where the architectural complex of the Provincial Forum was erected, on the upper part of the hill. With a large temple presiding over this latter one, it became the symbol of sacredness of the imperial power and a means for the political representation of the local élites.

In this paper we will approach these two areas as ideal case-studies of the dynamics that revolve around the setting up of large-scale building programmes and the complex economic system that is the construction. By looking in to the abundant archaeological record (which consists of not only the architectural remains but also the exceptionally well-preserved evidences of stone supply, such as the large quarry of El Mèdol and the remarkable collection of quarry marks preserved on a large number of blocks discovered on this same site), we will try to better understand the organisation of the building industry as well as the links and impact that it inevitably had on the overall economy of the town while contextualizing it within its geographical, social and political environment.

07 BUILDING MATERIALS, CONSTRUCTION PROCESSES AND LABOUR: THE TEMPLE OF ISIS IN POMPEII

Author: Recko, Cathalin - Universität zu Köln, DFG Graduiertenkolleg 1878 "Archäologie vormoderner Wirtschaftsräume" (Presenting author)
Keywords: Construction, Economy, Pompeii
Presentation Preference: Oral

Economic aspects of Ancient construction have long played a minor role in research, largely due to a lack of knowledge of actual monetary costs. Estimating labour requirements of buildings based on other pre-industrial sources, favourably 19th century engineering handbooks, led to a new approach for quantifying and valuating Ancient construction.

Looking at buildings, especially of different functions, the factors on which to base an architectural comparison are rather limited. If one simply looks at two buildings, then one might see that the marble used in the one was more precious than the brick used in the other. But constructing the brick building could still have been more time consuming, due to the chosen materials, architecture, and techniques. Thus, by carefully estimating the time and effort needed for the construction, including the production and transport of the materials, one obtains an objective basis for comparison. The question on which public building or building type the most labour, skill and time was spent has the strong potential to give valuable insights into a city's building economy.

To emphasize the practical part of this study, this paper illustrates a method for measuring and calculating the amount of required materials using the temple of Isis in Pompeii as an example. Each of the identified materials undergoes an operational chain from its production over transportation to the construction site until it is finally installed. A detailed presentation of these steps is limited to bricks in this paper. Some general remarks on Pompeii's brick production and distribution are included.

Ultimately, this study contributes to the ongoing research on labour as indicator for economic value of Ancient construction. But at the same time, it sets a new focus on the potential of comparing this data in different settings.

08 PRODUCTION AND COST OF THE CARTHAGO NOVA THEATER'S ARCHITECTURAL DECORATION

Author: Dr. Soler-Huertas, Begoña - Universidad de Murcia / ICAC (Presenting author)
Keywords: Theatre building cost
Presentation Preference: Poster

Over the past few years, several publications have approached the issue of building costs in the Roman period, and in these a number of economic and temporal parameters concerning the construction of complex buildings are contemplated. In addition to P. Barresi's ideas about public architecture in Asia Minor and architectural decoration in Pozzuoli's amphitheatre, other contributions must be highlighted, such as those concerning the superior forum in Tarraco and, more recently, the forum in Segóbriga.
Our current research focus, centred on the planning and production processes involved in architectural decoration, has allowed for the implementation of an experimental technique for the quantitative evaluation of the quality of locally and regionally sourced materials for which barely any historical or epigraphic evidence exists. This methodology, used for the assessment of the cost of the architectural decoration at Caragena's theatre, has offered interesting results in estimating the cost of materials for which the application of equivalences based on Diocletian's Edictum de Prettis is problematic. For this, parameters such as market conditions and price variability between regions have been considered. The reconstruction of the manufacturing process involved in architectural elements in marbles and coloured limestone, has offered valuable information about the market for decorative stones and also offers a preliminary assessment of the cost in sesterces of production, distribution and commercialisation of these architectural elements.

09 RETHINKING MONUMENTALITY IN TEOTIHUACAN, MEXICO

Author: Torras Freixa, Maria - Universitat de Barcelona (Presenting author)
Keywords: architecture, urbanism, state-formation
Presentation Preference: Oral

The ancient city of Teotihuacan, AD 0-650, was unique in America by size (20 km2 and 125.000 inhabitants) and by a perfectly designed grid plan divided in four sections by two avenues. The civic-ceremonial centre was dominated by three monumental temple pyramids: the Moon Pyramid, the Sun Pyramid and the Ciudadela with the Feathered Serpent Pyramid.

Until recently, these large-scale constructions were considered to belong to the earliest building stages, AD 0-200. Yet research since the 1990's reveals that only the Moon pyramid starts early and very modest in size, at a 11º orientation, while the three pyramids arise in their monumental form in a very short period, between AD 200-250, at a 15º30' orientation, implicating a huge labour input. Thereafter, the construction effort is geared mainly towards building apartment compounds till the city's collapse.

This recent vision forces to reevaluate the context in which the city achieves its monumentality and the political and socio-economical processes that triggered the large-scale project. To approach these questions, I will use as data the building sequence, size, techniques, materials, decoration, orientation of the pyramids, their location within the settlement, and their dedication caches that include offerings with human sacrifice.

The purpose of that paper is to follow the sequence leading up to the monumental construction, showing the existence of a master urban plan initiated in the Tzacualli phase (AD 0-150), reconfigured in the Miccaotli phase (AD 150-200), and monumentalized in Early Tlamimilolpa phase (AD 200-250). The changes in orientation and the introduction of human sacrifice show an increase in authority coupled to the emergence of new symbolic discourses. In that sense, rethinking monumentality in Teotihuacan is a first step to understand political and socio-economic issues in the city's configuration.

10 EARLY MEDIEVAL CONSTRUCTION INDUSTRY. LEAVING THE DARKNESS

Author: Dr Utrero Agudo, Maria de los Angeles - EEA-CSIC (Presenting author)
Co-Author: Dr Semple, Sarah - Durham University
Keywords: Early Medieval Architecture
Presentation Preference: Oral

Current archaeological approaches to Early Medieval standing ecclesiastical buildings (7th-10th centuries) sited in Western Europe are providing relevant information regarding the understanding of these constructions as manufactured products related to a precise social and economic context. Craft activities are evident in the quarries (traces of tools, stones found on site), in the buildings (techniques, traces of tools, putlog holes), and in the working areas (construction site, kilns, mortar-mixing basins); their records are key to knowing the construction project along with the historical sequence of the building. Analysing the traces of these activities make possible besides to approach the skills and knowledge of the artisans, the resources of the patrons and the material and human investments and efforts employed to carry out these projects.
This paper will briefly show how archaeological, historical, geological and ethno-architectural methodologies have been applied together to record these aspects in several examples of churches in Spain, Portugal and England, being thus possible to understand how building activity was an important industrial sector during Early Middle Ages, since it demanded a wide range of workers, materials and techniques and had therefore a significant impact on the landscape and on the economy.

11 ARCHITECTURAL DESIGN AND CONSPICUOUS CONSUMPTION AS SOCIAL STRATEGY IN MYCENAEAN COMMUNITIES.

Author: Mrs Efkleidou, Kalliopi - Aristotle University of Thessaloniki (Presenting author)
Keywords: Aegean, mycenaean, architecture
Presentation Preference: Oral

Mycenaean monumental architecture (mostly cyclopean walls, palaces and tholos tombs) has received a lot and significant scholarship as far as techniques, workmanship and time/effort expenditure are concerned. It has also been extensively discussed with reference to its symbolic properties vis-a-vis the status, wealth and power of those initiating

and seeing through the construction of monumental structures, i.e. the elite and/or the wanax. Yet issues relating to the experience of mycenaean architecture have not been widely or extensively discussed.

Architecture is not only "a combination of spaces, events and movements" and our experience is not only "the experience of events organized and strategized through architecture" as B. Tschumi (2000: 76) argues. Architectural design and architectural conspicuous consumption (in the choice of materials, in the size of building blocks, in construction methods, in investment of resources) can become the threads that strategically weave together and manipulate people's movement, behavior, senses and feelings.

This paper focuses on the mechanisms through which architecture can relate and communicate particular views on the existing or the imagined and desired social order. I focus on particular monuments or larger building programs from the Late Bronze Age sites of Mycenae and Tiryns and contextually explore their design, construction and experiential aspects of people's engagement with them. My aim is to demonstrate that architecture was strategically used as a medium for sociopolitical display and group identities' negotiation not only for the elite. Architecture's permanent character, rather, allowed for it to function as a long-term and perpetual medium for all constituents of respective communities to display, affirm and negotiate their place in the existing social order.

Tschumi, Bernard (2000) Six concepts, in Alan Read (Ed.), Architecturally speaking: Practices of art, architecture and the everyday (155–76), London

12 SCALE OF LABOUR INVESTMENT AT THE LATE BRONZE AGE FORTIFICATIONS IN THE SOUTHERN CARPATHIAN BASIN

Author: PhD. Student Czukor, Peter - Eötvös Loránd University (Budapest, Hungary) (Presenting author)
Keywords: Bronze-Age-Hungary, Fortified-settlements, Labour
Presentation Preference: Oral

Recent research has shown that southeastern Hungary and northwestern Romania are characterized by the emergence of a series of smaller and larger fortified settlements during the Late Bronze Age, ca. 1300-1100 BC (Rei. BrD–HaA1). The size and character of these sites seem to vary considerably throughout the region concerned, with settlement sizes ranging from 1700 hectares to 1, and fortifications ranging from a simple single ditch to a system of multiple ditches and ramparts enclosing huge areas. The fortifications are surrounded by a series of smaller rural settlements, forming a three-tiered settlement hierarchy, indicating a fairly complex society. The function of these settlements is debated to some degree, as they have not yet yielded substantial domestic remains, and their interpretation as refugia or ritual centres is also possible. In my presentation I will focus to the scale of labour investment and the control over labour of the construction of this large fortified settlements. I will use GIS-based and statistical analysis, and these result will compare different cultural anthropological and experimental archaeological examples. The main aim to understand relationship between the scale of the fortifications and the investment of labour to estimate the area of territories.

13 THE IMPACT OF LARGE SCALE CONSTRUCTION ON ROMAN CITIES. WOULD OUR PLANNING AUTHORITIES APPROVE THEM?

Author: Dr Stöger, Hanna - Universiteit Leiden (Presenting author)
Keywords: architecture, economy, sustainability
Presentation Preference: Oral

Most of today's large building projects in urban and in rural contexts undergo strict planning processes and require official approval by the local planning authorities before development can commence. Can we imagine similar processes for antiquity? Would most of the larger Roman projects have been approved had they been exposed to a strict environmental impact assessment as today's large-scale developments?

The proposed presentation uses Ostia, the port-town of Imperial Rome, as a case study to explore the impact of large-scale public or semi-public buildings on the existing urban environment. Examples to be discussed include the mid-second century AD Forum baths of Ostia. This thermal complex extended over almost a quarter of the original city centre, while a number of earlier streets had to be cancelled and preceding city blocks had to give way to the new development. Other examples come from Ostia's late antique exedra, a semi-circular area with colonnades and water features located on the southern side of the decumanus, the city's mayor east-west axis. When it was installed there, it blocked a previously important street, cutting off the connection from the decumanus to the south-eastern city gate. We can also think of Ostia's Case a Giardino, a lavishly planned housing estate similar in conception to our gated communities. Within a short period after its completion, a number of its residential buildings were converted into commercial and industrial premises. Did this project fail to meet the requirements of the local housing market, or was it too ambitious to be sustained in the long run?

Next to the physical impact of such construction on the immediate and the wider city we also need to assess the economic bearings they had on the city. The paper seeks to encourage a discussion which bridges present and past concerns about 'sustainable' urban development.

14 INTERDISCIPLINARY APPROACH OF THE EVOLUTION OF A CONSTRUCTION: CASE STUDY OF THE CRYPT OF ST SEURIN'S BASILICA IN BORDEAUX

Author: Dr Guibert, Pierre - IRAMAT CNRS
Co-Author: Ass Prof Michel, Anne - Ausonius, Université Bordeaux Montaigne (Presenting author); Dr Urbanova, Petra - IRAMAT, Université Bordeaux Montaigne (Presenting author)
Keywords: Building-Archaeology, Early-middle-ages, Building-archaeomaterials
Presentation Preference: Oral

The St Seurins's basilica as we know it nowadays is the result of various construction stages and reshaping since the late roman period. Our principal concern is the study of the most ancient parts still visible of this major religious building of Bordeaux. Our aim is to understand how and when its successive transformations occurred in the Early Middle Ages. We undertook an interdisciplinary research crossing building archaeology, archaeomaterial studies and physical chronology in a narrow space of the basilica, the crypt, which was originally a funerary area since the late Antiquity.

Far from routine operations, the investigations in Saint Seurin contributed to the development and the validation of a novel dating technique of archaeological lime mortars by Single Grain Optically Stimulated Luminescence (SG-OSL). Archaeological observations and mortar analyses (macroscopic facies, mineral and elemental composition, chronology) allowed us to propose a consistent sketch of the progressive laying out of the crypt between the end of the 4th and the 10th century. Thanks to a detailed observation of the stratigraphy associated with the study of archaeomaterials, we document the building transformation that was the result of a change of a funerary memory into a religious practice controlled by the Church. The change of the function of the site implied an evolution of the construction that integrated a former mausoleum as a reused structure. This early medieval building is at the origin of the construction of the St Seurin church and the subsequent development of new settlements which were included lately during the post-medieval times in the Bordeaux urban area.

273 STONE AGE CAMPSITES AND SETTLEMENTS ALONG THE RIVER BANKS AND FLOODPLAINS

Theme: 6. Interpreting the archaeological record
Author: Flamman, Drs. Jeroen (Netherlands) - Vestigia Archeologie & Cultuurhistorie, Amersfoort
Co-Author(s): Crombé, Prof. Dr. Philippe (Belgium) - Ghent University, Department of Archaeology, GentDevriendt, Dr. Izabel (Belgium) - Archeo Lithics, GentMüller, Drs. Axel (Netherlands) - Archeologisch Dienstencentrum, AmersfoortRensink, Dr. Eelco (Netherlands) - Cultural Heritage Agency of the Netherlands, Amersfoort
Keywords: Mesolithic, Early-Neolithic, watercourses, landscapes, site-location
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

During the last decades many sites dating in the Mesolithic and Early Neolithic (till 4200 cal BC) have been excavated in the Netherlands and Belgium. Those sites were situated in Late Pleistocene and Early Holocene landscapes in the direct proximity of, or along (former) rivers. Whereas previously such sites were unknown or not expected, recent research demonstrates that such sites do appear in these landscapes and that they are well preserved. Well preserved archaeological finds and organic materials have been excavated on sites located in the Holocene river deposits in particular, thanks to the wet conditions of those deposits. These finds offer new, and in comparison with the higher Pleistocene sand regions more detailed, images of the occupation and use of landscape in the areas along the rivers.

Mesolithic and Neolithic sites along water courses, river banks and on flood plains are not only known in the Netherlands and Belgium, but also elsewhere in Europe. The aim of this session is to compare research methods and results from sites across the Low Countries with research on sites in comparable environmental locations in the rest of Europe. This comparison can include sites discovered in downstream sedimentation areas as well as sites along rivers and streams in upstream or even more mountainous areas. Can water be seen as a 'pull factor' for transient groups or occupants of these landscapes? Which conditions were important when choosing these locations and what led to leaving these places to pitch or settle somewhere else?

01 STONE AGE CAMPSITES AND SETTLEMENTS ALONG THE RIVER BANKS AND FLOODPLAINS: AN INTRODUCTION

Author: Mr Flamman, Jeroen - Vestigia Archeologie & Cultuurhistorie, Amersfoort (Presenting author)
Keywords: river banks, floodplains
Presentation Preference: Oral

During the last decades many sites dating in the Mesolithic and Early Neolithic (9200-4200 cal BC) have been excavated in the Netherlands and Belgium. Those sites were situated in Late Pleistocene and Early Holocene landscapes in the direct proximity or along (former) rivers. Examples are the excavations along the Meuse in the south of the Netherlands (Well-Aijen, Ooijen-Wanssum) and Belgium (Liège-Place Saint-Lambert), along the IJssel/Vecht in the east of the Netherlands (Mariënberg, Zutphen-Ooijerhoek, Hattemerbroek, Kampen-Reevediep, Schokland-P14, Emmeloord, Swifterbant), the Eem in the middle of the Netherlands (Baarn, Almere-Hoge Vaart), the Schelde in Belgium/ West-Netherlands (Kerkhove, Bazel, Doel, Terneuzen) and the Rhine in Germany (e.a. Bad Bedburg). The sites date in the Mesolithic and/or the Early Neolithic. In some cases there is evidence for a regional or even a local continuity in residence between both periods.
The sites offer new insights in the use of the with watercourses connected landscapes, the choice of the site location and the development in material culture by hunter-gatherers and early farmer societies. In addition the locations in or near zones of fluviatile Holocene sedimentation yield also opportunities for the research of organic and archaeobotanic material. This resulted in new knowledge about the local and regional developments in vegetation and the influence of men on this natural environment. At some excavations like Zutphen-Ooijershoek (NI) and Liège and Bazel (B) and dredging finds have demonstrated also many objects of organic material can be preserved.
Mesolithic and Neolithic sites along river banks and on flood plains are not only known in the Netherlands and Belgium, but also elsewhere in Europe. The aim of this session is to compare methods and results of research of these kind of sites from the Dutch/Belgian contexts with researches of sites in comparable environmental situations -near watercourses- in the rest of Europe.

02 HOLOCENE POINTBAR FORMATION ALONG THE RIVER MEUSE: SETTING THE LANDSCAPE FOR MESOLITHIC AND NEOLITHIC HABITATION IN WELL-AIJEN (SOUTHERN NETHERLANDS)

Author: Dr.ir. Tebbens, Leo - BAAC (Presenting author)
Co-Author: Msc. Kalisvaart, Chris - BAAC
Keywords: Meuse, Mesolithic, Neolithic
Presentation Preference: Oral

River management measures triggered extensive geo-archaeological research along the rain-fed River Meuse, which drains the Ardennes en southern Netherlands. The Well-Aijen study area situates in the Venlo graben, which is part of the subsiding Roer Valley Graben system. Here, a record of late-glacial and early-holocene fluvial sediments is well-preserved under a late-holocene loamy cover. During the Late Glacial, the Meuse had a coarse sandy tot gravelly floodplain with a braided channel pattern. Climatic amelioration caused the Meuse to incise deeply into its Younger Dryas floodplain. The Meuse adopted a single meandering channel that migrated laterally during the Early to Middle Holocene, forming pointbars already before 9800 BP. Archaeological excavations have revealed a wealth of Mesolithic and Neolithic sites on the pointbar ridges and their eastern flanks. The pointbars have been dated by both OSL on sand and by AMS-14C on charred hazelnut scales from archaeological sites on top of them. This allowed us to reconstruct the paleogeographical development of the landscape in time-steps of ~500 years. In our lecture, we will present a set of paleogeographical maps, showing a close relationship between the abiotic landscape, site-selection by early- to late-mesolithic hunter-gatherers and the start of land 'reclamation' and land use by sedentary Neolithic farmers. Following deforestation in the hinterland of the River Meuse drainage basin between the Bronze age and Roman era and as a response to sea-level rise, the Meuse lower reach increasingly suffered from flooding events. Consequently, the prehistoric landscape became covered with loamy sands, that preserved the archaeological record. We conclude that early- to late-holocene landscape evolution is a key factor to understand and disclose the sites of Mesolithic hunter-gatherers. It also contributes in unravelling the process of neolithisation in the Meuse river valley in the southern Netherlands.

03 AN CONTINUOUS BOTANICAL, SEDIMENTOLOGICAL AND ARCHAEOLOGICAL RECORD AT WELL-AIJEN, MEUSE-VALLEY, THE NETHERLANDS: LANDSCAPE AND VEGETATION DURING THE LAST 8000 YEARS

Author: Dr. Bos, Johanna A. A. - ADC-Archeoprojecten
Co-Author: Dr. Zuidhoff, Frieda S. - ADC-Archeoprojecten; Mr Müller, Axel M. - ADC-Archeoprojecten (Presenting author)
Keywords: palynology, Meuse-river-valley, vegetation-reconstruction
Presentation Preference: Oral

Continuous high-resolution Holocene palynological records from the Meuse river valley were missing until recently. Most sediment records reflect short time-intervals or are characterised by hiatuses. In 2011, a deep infilling of a residual channel of the Meuse was recovered at Well-Aijen. In order to investigate environmental and inferred climatic change during the Holocene, detailed botanical and sedimentological analyses were carried-out at a high-temporal resolution. A chronology of the 8000-year record was provided by five AMS 14C dates.
The record reflects the Boreal to early Roman Period. The location of the residual channel is unique as the river floodplain and nearby terraces were inhabited almost continuously from the Mesolithic to Roman period. Based on the botanical analyses a direct relation was made between human occupation and vegetation changes in the landscape, and introduction of domesticated crops.
During the Early Holocene dense mixed woodlands developed and Mesolithic hunter-gatherers were occupied the river floodplains. Around 4365 BC (Neolithic) small-scaled openings were made in the woodlands for cereal cultivation. In the Iron Age, large floods occurred, caused by the deforestation of the hinterland, and people were forced to move to the higher terraces. This situation continued during Roman and Medieval times.

04 EXCAVATING A STONE AGE LANDSCAPE: ARCHAEOLOGICAL PRACTISES OF LARGE SCALE STONE AGE FIELDWORK.

Author: Doctorandus (Drs.) Muller, Axel - ADC (Presenting author)
Keywords: excavations stoneage landscape
Presentation Preference: Oral

Due to a large scale civil engineering project, hundreds of acres in the Meuse valley will be exploited for gravel and sand. After an elaborate archaeological assessment numerous sites have been mapped. A lot of sites dated to the Mesolithic and early Neolithic. These discoveries pushed the earliest occupation of the Meuse floodplain back for several millennia. Because the exploitation was a direct threat for the archaeology, more than 25 sites had to be excavated in the time frame of three summer campaigns.
The relation between the occupation and the dynamic fluvial landscape was a primary research goal. This landscape archaeological approach was a major challenge; how can one excavate a stone age landscape.
From the earliest start of the excavation there was a close cooperation between all the stakeholders and the whole process of fieldwork was a joint effort. We developed a strategy where almost all the practices and techniques of stone age archaeology, ecology and geography were combined to collect data about the landscape, the vegetation and the occupation between 9000 and 2000 BC. This demanded a great flexibility from the excavators and a constant data processing to make the right choices within the limits of this project. In this lecture we will present the research goal, the fieldwork strategy and give a short summery of the results. Detailed information about the landscape, ecology and the interaction of the stone age occupation will be presented in separate lectures.

05 THE LITHIC INDUSTRY AT WELL-AIJEN (LIMBURG, THE NETHERLANDS). CENTURIES OF MESOLITHIC AND NEOLITHIC HABITATION ALONG THE RIVER MEUSE.

Author: Dr. Devriendt, Izabel - Archeo Lithics (Presenting author)
Keywords: Lithic artefacts, Mesolithic
Presentation Preference: Oral

On the riverbank of the Meuse, between the village Well and the hamlet Aijen, test trenches revealed numerous campsites dating from the Early to the Late Mesolithic but also uncovered many artefacts and features from the Neolithic and Bronze Age.
During three summer campaigns several of these Mesolithic campsites have been excavated. The research results show a strong relation between the river and the occupation areas. Even more, during time a shift in land use, habitation frequency and site function is visible. From the preboreal Mesolithic onwards, the area was popular for raw material collection and testing (mainly flint), yet a variation of other activities was carried out as well. During the Middle and Late Mesolithic different choices were made and other priorities seemed to matter as tool composition changes and occupation frequency declines. Roughly fifteen Mesolithic sites have been analysed on aspects of chronology, typology, technology, raw material use, spatial patterning and site function. The results of these analyses will be presented at the conference.
Also during the Neolithic, the area was used and inhabited in different intensities. For instance, evidence of the LBK Culture (Linearbandkeramik) is very scars, while material and features of other Neolithic periods, such as the Swifterbant Culture or the Rössen Culture, are far more abundant. One of the most striking aspects of the Rössen occupation phase is the extensive quartzite knapping at the site. It seems non-flint stone tools are more important during these younger occupation phases than during the Mesolithic. The discovery of several Middle and Late Neolithic features and house plans suggest the continuing use of the area throughout time. Although the lithic material from these sites has not been analysed in the same detail as the Mesolithic material, it provides an overview of centuries of occupation and lithic technology and evolution.

06 THE FUNCTION OF MICROLITHS IN THE DUTCH RIVER BANKS: THE EXAMPLE OF WELL AIJEN.

Author: MA Verbaas, Annemieke - Leiden University; Stichting LAB (Presenting author)
Co-Author: Dr García Diáz, Virginia - Leiden University
Keywords: Microliths, use-wear, experiments
Presentation Preference: Oral

The site of Well Aijen (South Limburg, the Netherlands) was excavated in three campaigns in 2012, 2013 and 2014. A large flint assemblage dating to the Mesolithic was found, including a large number of microliths. Traditionally, microliths have been interpreted as arrowheads and arrow armatures and, consequently, as direct evidence for hunting. However, over the years, use-wear analysis has proven that microliths were also used for other tasks. To obtain a better insight in the use of microliths in Well-Aijen we analysed 117 microliths. The analysis showed that microliths were used in a wide variety of activities and were hafted in different ways. To fully understand the functionality of the implements, a series of experiments were performed. The main objectives of the experiments were: a) to understand the way microliths can be hafted; b) the effect of hafting on the traces of wear and c) to understand the functionality of microliths as composite tools. The results of this analysis confirm that the interpretation of microliths as solely hunting related

artefacts is not necessarily valid. It is clear that the role of microliths in the technological system was much more elaborate than traditionally thought. This research shows that use-wear analysis can and should be extended to the microliths of other riverbank assemblages to obtain a more complete view of settlement function and daily life of Mesolithic communities.

07 THE MESOLITHIC WETLAND-SITE OF KERKHOVE-STUW (UPPER-SCHELDT VALLEY, WESTERN BELGIUM).

Author: Mr Vandendriessche, Hans - Ghent University (Presenting author)
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Keywords: wetland Mesolithic palaeoenvironment
Presentation Preference: Oral

Prior to the excavations at Kerkhove-Stuw, carried out in 2015-2016 by GATE bvba and Ghent University , data gathered through manual and mechanical coring demonstrated the presence of Mesolithic occupations on the top of a Late Glacial levee, adjacent to a palaeochannel of the river Scheldt. The presence of thick packets of Holocene peat and alluvial deposits on top of the levee indicated good preservation conditions for both the archaeological and environmental remains.
Subsequent excavations over a surface of ca. 4000 m^2 led to the discovery of thirteen lithic concentrations dating from the early to the late Mesolithic, which were all fully excavated. The first 14C-dates on burnt hazelnut shells, however, suggest that the main occupation took place in the first half of the Boreal. Within these clusters, nine possible surface hearths could be derived from the spatial clustering of severely burnt lithic and organic residu, e.g. burnt hazelnut shells and calcined bone fragments. Besides lithics and burnt/charred organic remains, the site exceptionally yielded unburnt faunal remains. Despite their fragmentation, the analysis demonstrates the dominance of roe deer and wild boar, next to fur animals and numerous fish remains.
High-resolution multi-proxy palaeoenvironmental research mainly focused on the channel infilling, which consists of calcareous gyttja covered by peat. According to the first results, sedimentation started in the Late Glacial (probably Younger Dryas) and continued during the Early to Middle Holocene. During the Mesolithic occupations the Scheldt seemingly was already reduced to a shallow, slow running stream, however with an abundant riparian vegetation. The latter was exploited by Mesolithic hunter-gatherers for tool production (basketry, nets, ropes, etc.), as indicated by the wear traces on numerous flint tools.

08 STONE AGE OCCUPATION ALONG THE REEVEDIEP, NEAR THE IJSSEL RIVER AT KAMPEN (THE NETHERLANDS)

Author: Drs A. Muller Muller, Axel - ADC (Presenting author)
Keywords: stoneage riverbank
Presentation Preference: Oral

Prior to the construction of a large flood channel near the city of Kampen (provincie of Overijssel) an extensive stone age site had to be excavated. The site is part of a large stone age, predominantly Mesolithic, landscape on the west bank of a fossil river system. Before the actual excavation the assessment of the augering campaign showed a clear division in an east side with high densities of flint and a west side with a lower artefact density. Six flint concentrations were chosen for further excavation, two of which were fully excavated. The analysis of the finds has not yet been finished, but the preliminary results testify to occupation ranging from the late Preboreal (transition from the Late Palaeolithic to the Early Mesolithic) to the Early (?) Swifterbant. This presentation will focus on two important clusters with a very specific flint assemblage. The first cluster dates to the Late Mesolithic (trapezes are the dominant tool-type) and shows evidence for the presence of a dwelling-structure. The second cluster dates to the Middle Mesolithic of the Rhine-Meuse-Scheldt area which is characterized by feuilles de gui. Kampen represents the most northern occurrence of this RMS-type Mesolithic. One of the research goals is to understand the role of river systems in relation to the distribution of these specific regional types of flint tools.

09 NEOLITHISATION OF THE SOUTHERN NETHERLANDS: NEW INSIGHTS FROM THE WELL-AIJEN EXCAVATIONS (RIVER MEUSE VALLEY)

Author: Msc. Mooren, Sjaak - BAAC
Co-Author: Msc. Drenth, Erik - via BAAC (Presenting author)
Keywords: neolithisation, Meuse valley
Presentation Preference: Oral

Several discoveries made during recent, large-scale excavations at Well-Aijen (River Meuse valley, province of Limburg) shed new light on the neolithisation of the southern Netherlands. Here, new sites covering the timespan from the entire Mesolithic up to the Bronze age were discovered in the top of River Meuse early holocene pointbars. Most importantly, very rare and well-preserved sites from the 5^{th} and 4^{th} millennium BC could be studied in detail. This presentation will deal with new results based on material culture, archaeobotanical remains and a set of AMS-14C-datings to provide some food for thought on the neolithisation process in the southern Netherlands. Hitherto it was generally assumed that the Michelsberg culture played a crucial role in this process. Under the influence of this culture, the last hunter-gatherers are thought to have gone over to a neolithic life style from c. 4200 BC onwards. The Well-Aijen investigations suggest that in this transition the role of the Rössen culture (c. 4600-4300 BC) and the Bischheim Group (c. 4300-4200 BC) may have been far more important than so far thought. Moreover, in view of earlier finds of the Rössen culture along the River Meuse, its valley may have been an important corridor for Neolithic pioneers/settlers and for cultural exchange between co-existent cultural groups in the early-Neolithic.

10 THE SWIFTERBANT CULTURE IN THE LOWER SCHELDT FLOODPLAIN (NW BELGIUM)

Author: Messiaen, Liesbeth - Ghent University, Department of Archaeology (Presenting author)
Co-Author: Storme, Annelies - Ghent University, Department of Geology; Teetaert, Dimitri - Ghent University, Department of Archaeology; Halbrucker, Éva - Ghent University, Department of Archaeology; Prof. Dr. Crombé, Philippe - Ghent University, Department of Archaeology
Keywords: Swifterbant culture, Neolithization
Presentation Preference: Oral

Five sites excavated at Doel Deurganckdok, Melsele Hof ten Damme and Bazel Sluis yielded occupation traces attributed to the Swifterbant culture. They are located on Pleistocene coversand dunes and levees sealed by peat and alluvial clay deposits.

Bayesian modeling shows the dune sites (Doel) were inhabited when peat growth was interrupted by growing estuarine influence, starting around 4600 cal BC. The occupation ceased with renewed peat growth around 4000 cal BC (Crombé et al. 2015). The temporary camps were located on the higher grounds of the inundated landscape, where alluvial hardwood forest was present (Deforce et al. 2014). Recent analysis of the microremains suggest a local freshwater environment with tidal influence for the lower parts of the landscape. The food procurement strategies were broad: seeds, nuts and fruits were gathered (Deforce et al. 2013), large mammals like wild boar and red deer were hunted and freshwater fish was caught (Van Neer et al. 2013). Indirect evidence for cattle herding is present in the form of ivy and mistletoe seeds and wood, possibly used as winter leaf fodder. The recently initiated study of the lithic tools points to a broad spectrum of domestic tasks conducted in these camps. Traces of processing dry skins are numerous, as well as wood, plant and bone working.

The chronology of the Swifterbant occupation on the levee sites (Melsele, Bazel) is still unclear due to palimpsest problems. The sites yielded the first hard evidence of domesticated animals and cereals in the lower Scheldt valley from 4300 cal BC onwards. Grains from e.g. bread wheat and bones of goat/sheep, pig, and cattle were found together with remains of wild species like red deer (Meylemans et al 2016). Ongoing research of the material culture finds will complement our understanding of these sites.

11 DIGGING IN THE DELTA AREA: A SWIFTERBANT SITE ON A CREEK LEVEE AT NIEUWEGEIN (THE NETHERLANDS); FIRST RESULTS.

Author: Ms Leijnse, Kirsten - BAAC
Co-Author: Ms Molthof, Helle - RAAP (Presenting author)
Keywords: Neolithic Swifterbant wetland
Presentation Preference: Oral

In the winter and spring of 2017, a large Swifterbant site was excavated at Nieuwegein in the Netherlands. The site is situated on the creek levee of a former river, nowadays named the "Wiersch"-riverbed. Since the site was abandoned by its inhabitants around 4000 BC, the creek levee has been covered by two metres of peat and clay. Although this significantly complicated the fieldwork, it also meant that the remains were very well preserved, both in terms of intactness and conservation. Apart from flint, stone and pottery finds, extensive sieving led to the discovery of a large number of animal bones, some of them worked into tools. The site even yielded three inhumations and many scattered human bones.

The number of known Swifterbant sites in the Netherlands is limited, and especially in the delta area they only comprise a few. The Swifterbant culture is typical for the transition from a hunter-gatherer to an early farming community, and the bone assemblage at Nieuwegein can provide us with information about this transition in the delta area. Other issues we are aiming to address during the analysis stage, are contacts with other simultaneous groups, like for example the Michelsberg culture in the south of the Netherlands, and the landscape development during the occupancy of the site.

In this paper, the first results of the research at Nieuwegein will be presented and placed in the context of similar sites, both diachronically and geographically.

12 THE SWIFTERBANT SITES OF TIEL-MEDEL (CENTRAL NETHERLANDS): A FIRST IMPRESSION

Author: Mr Ten Anscher, Theo - RAAP Archeologisch Adviesbureau, Weesp (Presenting author)
Keywords: Neolithic, Tiel-Medel
Presentation Preference: Oral

At Tiel-Medel two Swifterbant settlement sites are being excavated from november 2016 through summer 2017. They are situated along the same watercourse on clay sediments formed as a result of a break in a the embankment of the "Ommeren" riverbed, a precursor of the Rhine river . Both sites date around 4250-4000 BC and can be attriuted to late Swifterbant (SW2b).

13 CORRELATION BETWEEN THE LOCATION OF THE CAMPSITES OF THE STONE AGE AND CHANGES OF THE KAMA RIVERBED

Author: Dr. Lychagina, Evgeniia - Perm State Humanitarian Pedagogical University
Co-Author: Dr. Zaretskaya, Nataliya - Geological Institute of RAS (Presenting author); Prof. Chernov, Alexey - Moscow State University
Keywords: campsites, palaeochannel analysis
Presentation Preference: Oral

The study area is situated in the Cis-Urals flatlands, in the basin of the Kama river. The Chashkinskoe Lake is presently a system of oxbow lakes interconnected with abandoned channels. The right bank of this lake is a submerged floodplain lowland, the left bank is represented by a ledge of a terrace above the floodplain. In the course of palaeochannel analysis, it was possible to distinguish the remains of a low terrace and 7 different floodplain generations on the Chashkinsky floodplain massif and adjoining plots.
The most ancient is the 7th floodplain generation dated back as Early Holocene. At this time, there was a process of initial development of the region and the appearance of Mesolithic sites. Mesolithic campsites were located on the edge of a low (2-5 m) 1-st terrace (Chashkinskoe Lake V and Zaposelie), on the banks of streams flowing into the lake (Chashkinskoye Lake X, settlement Zaposelie) and on the high 1-st terrace, at 0,06 km from the modern shore of the lake (Chashkinskoe Lake XI).
Active settlement of study area coincides with 6th floodplain generation and climatic optimum of the Atlantic period. By this time, Neolithic campsites existed in the area. The main channel of Kama was located under the left bank of the modern lake. Most of the Neolithic sites were located directly on the shore of the lake. Exceptions are the Khutorskye campsites, which were far from the riverbed on the shore of a small pond.
The conducted research has shown the presence of the dependence of the location of Stone Age campsites on changes in the riverbed.
This study was supported by RGSF, project 17-11-59004a/U.

14 IN SEARCH OF A NEOLITHIC WORLD - 2,5 METERS BELOW THE SURFACE

Author: Drs Sleijpen, Edmée - municipality Nieuwegein (Presenting author)
Co-Author: MSc Sprangers, Joel - RAAP Archeologisch Adviesbureau; MSc Janssen, Loes - Municipality Nieuwegein
Keywords: landscape neolithic
Presentation Preference: Poster

The municipality of Nieuwegein is developing a business park named 'het Klooster". Here, old river systems created a layered record of sands and clays. At the base of this Holocene deposits, cover sands are present.
Before 2015, little was known about the geological setting. The maps available simply weren't detailed enough. Therefore, in 2016 Nieuwegein commissioned a large-scale coring survey (4500 corings in total). Main goal was to get a detailed paleogeographic map on which conclusions could be drawn about the presence of possible Stone Age sites from 125 m2 onwards. Using a grid of 10 x 12.5 m, the paleolandscape was mapped accurately by coring (up to 6 meters below surface), and soilsamples were taken in search for archaeological traces. This resulted in three larger areas of interest, on both riverbelt and cover sands. Here, pieces of flint stone and pottery were found in the soilsamples. Further investigation by trail trenches and an excavation at the most interesting location revealed a small Neolithic settlement dating back around 4000 BC, and situated on a former river belt - 2,5 meters below the surface. Multiple pottery fragments, flintstones, worked bone, bonefragments and a at least three human burials have been found. The site is associated to the Swifterbant culture, which is quite unique for this area.
In order to discover, protect and document the larger archaeological sites in this area, as well as the smaller locations of interest, both testpits and trenches were used as means of investigation. First results show a dynamic, hidden paleo landscape with several traces of human activities throughout time .
The results in Nieuwegein show that geoarchaeological coring can be used to map the geological setting in detail, and in combination with testpits and trenches, stone age sites can be traced efficiently.

275 IN PLAY: ARCHAEOLOGY IN VIDEOGAMES AS A METADISCIPLINARY APPROACH

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Linde, Lennart (Germany) - Goethe University Frankfurt
Co-Author(s): Dennis, L. Meghan (United Kingdom) - University of YorkPolitopoulos, Aris (Netherlands) - Leiden UniversityMol, Angus A. A (United States) - Stanford UniversityAriese-Vandemeulebroucke, Csilla E. (Netherlands) - Leiden UniversityBoom, Krijn H.J (Netherlands) - Leiden University
Keywords: archaeogaming, videogames, narratives
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Video games, in contemporary society, provide a platform for the experience and expression of a multitude of pasts, some hewing more realistically to the historical record than others. Through the practice of utilizing archaeological principles we can study, map, and assist in the creation of the collective experiences of these pasts in new and innovative ways.
Within video games, individuals experience narratives - historical, semi-historical and fictional - through the interaction with virtual material culture, agents, and events. Millions of players are exposed daily to history through video games. These interactive media shape the public perception of the past in vastly different ways than any traditional medium has done until today. Thanks to the interactive nature of video games, players are not only passive consumers of information but active contributors to the way the past is experienced.
We as archaeologists can tap into these experiences through the study of those processes, materials, and narratives. Video games can also act as a tool to disseminate historical knowledge to the public from a bottom-up perspective, where the actions and choices of the players matter.
Papers in this session aim to showcase the possibilities of using archaeology within video games for the study and construction of historical narratives. The goal is to examine those shared experiences created in video game stories through an archaeological scope. This session will also act as a platform for the consideration of new approaches on this intriguing topic.

01 THE NO MAN'S SKY ARCHAEOLOGICAL SURVEY: ONE YEAR OF IN-GAME ARCHAEOLOGY

Author: Reinhard, Andrew - University of York; No Man's Sky Archaeological Survey (Presenting author)
Keywords: archaeogaming
Presentation Preference: Oral

On 9 August 2016 the No Man's Sky Archaeological Survey team launched its project to conduct practical archaeological fieldwork within the infinite universe of No Man's Sky. 20+ archaeologists, both generalists and specialists, worked together to explore the ideas of procedurally generated culture, artifacts, structures, ethics, and more, considering everything from landscape archaeology to archaeolinguistics. The NMSAS team was provided with a bespoke collections management system (FAIMS) for recording survey results in-game, but as might be expected from any journey into the unknown, things were different than anticipated in the months-long buildup to the survey's launch. What really happened within the game? Was the team able to conduct archaeological research, and if so, what did they learn? How were traditional tools and methods adapted for an all-digital environment, and what recommendations can be made as other archaeologists explore new open worlds/universes? This presentation will discuss the above, and will provide a preliminary report of findings after one year in (cyber)space.

02 TOMBS & TREASURE: UNDERSTANDING THE ARCHAEOLOGICAL ETHICS AT PLAY IN VIDEO-GAME PLAY

Author: Dennis, L. Meghan - University of York (Presenting author)
Keywords: ethics, video-games, Maya
Presentation Preference: Oral

The narratives presented in video-games surrounding archaeology and archaeologists are frequently at arm's length from the discipline itself. Locations are based on real places, but are not wholly situated in those places. Characters wear the trappings of archaeologists, but are not wholly archaeologists, and the stories they are part of are only archaeology in the loosest sense. Because of these distancing mechanisms within setting, characterization, and narrative, it is difficult to fully engage with the ethical issues of archaeological practice at play in video-games.

Tombs & Treasure offers the opportunity to explore the performance of archaeological ethics in video-games through an archaeological narrative, situated within the real archaeological site of Chichen Itza, while embodied in an avatar that is explicitly an archaeologist. The game, presented here as a case study, is utilized to explore how depictions of archaeological practice in video-game media are aligned (and misaligned) with archaeological ethics in practice. Comparisons will be made to more recent iterations of archaeological ethics in video-games, with the aim of establishing a preliminary history of how changes in archaeological representation can be mapped to changes in public perceptions of archaeology, and to changes in ethical practice within archaeology as a discipline.

03 ENTOMBED: AN ARCHAEOLOGICAL EXAMINATION OF AN ATARI 2600 GAME

Author: Aycock, John - University of Calgary (Presenting author)
Keywords: archaeogaming, digital excavation
Presentation Preference: Oral

One type of archaeogaming research is digital excavation, a technical examination of the code and techniques used in old games' implementation. Here we apply that to Entombed, an Atari 2600 game released in 1982 by US Games. The player in this game is, appropriately, an archaeologist who must make their way through a zombie-infested maze. Maze generation is a fruitful area for comparative retrogame archaeology, because a number of early games on different platforms featured mazes, and their variety of approaches can be compared. The maze in Entombed is particularly interesting: it is shaped in part by the extensive constraints of the Atari 2600 platform, and also had to be generated efficiently and use next to no memory. We used techniques from computer science, reverse engineering key areas of the game's code to uncover its unusual maze-generation algorithm, which we have also built a reconstruction of, and analyzed the mysterious table that drives it. In addition, we discovered what appears to be a 35-year-old bug in the code, as well as direct evidence of code-sharing practices amongst game developers.

What further makes this game's development interesting is that, in an era where video games were typically solo projects, a total of five people were involved in various ways with Entombed. We piece together some of the backstory of the game's development and intoxicant-fueled design using interviews to complement our technical work.

04 WONDERS OF CIVILIZATION: REPRESENTATION OF MONUMENTS IN SID MEIER'S CIVILIZATION SERIES

Author: Mr. Politopoulos, Aris - Leiden University; The VALUE Foundation (Presenting author)
Co-Author: Mr. Boom, Krijn - The VALUE Foundation; Leiden University; Ms. Ariese-Vandemeulebroucke, Csilla - The VALUE Foundation; Leiden University; Dr. Mol, Angus - The VALUE Foundation
Keywords: Archaeogaming Civilization Monuments
Presentation Preference: Oral

Video games are one of the present's quintessential virtual media and cultural forms, but also have a surprising and many-sided relation with the past. This certainly holds true for Sid Meier's Civilization (1991-2016), which is a series of turn-based, strategy video games in which you lead a historic culture from "the dawn of civilization to the space age." Civilization, often simply referred to as Civ, allows players to engage with past and present technological advances, social systems, and built heritage in a playful history that is closely analogous but always different to our own. Since its 1991 debut, Civ has sold more than 37 million copies worldwide. With 2 million copies sold in the first two weeks after publication and changing many of the previous games mechanics, the newest iteration Civ VI (2016) is the fastest selling game in the series yet.
In short, Civ is an enduring and massive commercial and critical success. Yet at the same time it also has a complex, and sometimes problematic, relation with its subject matter: world heritage, and history. This paper will discuss Civ not only as a collection of interactive media with a specific perspective on the past and a massive impact on popular knowledge of it, but also as an assemblage of artefacts that reflects 25 years of change in the field of video games, archaeology, and heritage. In particular, this paper will delve into the function and changing representations of 'Wonders,' a group of unique buildings that are closely analogous to World Heritage sites. By researching the occurrence of wonders per game, we will show how certain types of wonders have been introduced recently, whereas others have fallen out of grace.

05 FIRST STEPS IN THE USE OF GAMING ENGINES FOR HISTORICAL ROAD RESEARCH.

Author: Vletter, Willem - University of Vienna; University of Groningen (Presenting author)
Keywords: Roads modelling Unity
Presentation Preference: Oral

GIS applications have proven to be worthwhile for visualization and analysis of historical landscape. Indeed, they are capable to answer spatial related research questions. However, a GIS is quite static and there is often little interactivity. Indeed, the advantages of a gaming engine over a GIS are major dynamics and interactivity. The latter meaning the possibility to 'walk' around in a landscape and experience an higher level of embodiment of that landscape. Nevertheless, the analytical use of a gaming engine is not yet widespread. Therefore, the goal of this paper is to present the (analytical) potential for historical landscape research of gaming engines. More precisely, the possibilities for route modelling in the gaming engine Unity are demonstrated. Finalized, by comparing results of the reconstruction of a route in ArcGIS with the results of the same reconstruction in Unity.

06 PAST AT PLAY: HOW VIDEOGAMES CAN CHALLENGE ARCHAEOLOGICAL NARRATIVE STRUCTURES

Author: Ms Copplestone, Tara - University of York (Presenting author)
Keywords: narrative, archaeology, videogame
Presentation Preference: Oral

The videogame media format brings with it a wide array of unique affordances that can challenge the traditional structures for communicating, participating, constructing and understanding archaeology. These affordances stretch across the physical, digital, social and imagined spaces, providing an expansive space to play with the narratives of the past. Applying the theory of narrative structures to three videogames produced by the author this paper will explore the impact that the narrative structures embedded in these case-studies have on creating, communicating and understanding the past through play. The specific structures that will be looked at are procedural narrative, emergent environmental narrative and co-created narrative. The design and development for the case-study games will be examined in detail, unpicking how the videogame format can shape the narrative space for archaeology, before postulating the value which this space may have for the discipline at large.

07 JADE DRAGONS AND WOODEN CROSSES: CHANGING ATTITUDES TO ARCHAEOLOGICAL ARTEFACTS WITHIN THE TOMB RAIDER FRANCHISE

Author: Ms Fenton, Freya - University of Leicester (Presenting author)
Keywords: archaeogaming, artefacts, education
Presentation Preference: Oral

Core Design and Crystal Dynamics, the two major studios behind the Tomb Raider gaming series, have displayed very different attitudes towards archaeological artefacts over the years. During the Core Design era, there was usually a particular artefact, often imbued with some sort of mythological power, that the player would be forced to uncover before opposing forces seized it to carry out their grand schemes of world domination. These fictional items - the Scion, the Dagger of Xian, and more - were generally unconnected with the surrounding archaeological context (aside from thematically) and had no basis in reality. With the Tomb Raider reboot, beginning in 2013, Crystal Dynamics have working towards both realism and context - the latest game, Rise of the Tomb Raider, is awash with archaeological items for the player to discover and examine, most of which appear to have a fair grounding in both their surrounding context and historical reality. This paper will examine the game series as archaeological record, from the jade dragons collected in Tomb Raider 2 to the myriad items both everyday and extraordinary collected in the later games, as well as studying at how the games now inform and educate, potentially providing the catalyst for the training of future archaeologists.

08 DARK TOURISM IN 'THE TOWN OF LIGHT': DARK HERITAGE, PLAYER AGENCY AND PHENOMENOLOGICAL EXPERIENCE

Author: Ms Smith Nicholls, Florence - Independent researcher (Presenting author)
Keywords: archaeogaming, dark heritage
Presentation Preference: Oral

The term 'dark heritage' is often applied to archaeological sites associated with death and human suffering, though a clear definition has remained elusive. This is also the case for the sister concept 'dark tourism' which has been adopted in the field of geography. This paper will argue that videogames are useful for exploring and challenging concepts of dark heritage and dark tourism, as they represent a form of virtual tourism to dark heritage sites.

'The Town of Light' (LKA, 2016) is a first-person psychological adventure videogame set in a 1:1 recreation of Ospedale Psichiatrico di Volterra, a derelict asylum in Italy. Through revisiting the institution where she was held as a young girl in the early 20th century, the fictional protagonist Renée also specifically revisits memories of abuse and suffering she experienced there. The procedural rhetoric of 'The Town of Light,' through manipulation of player agency and the phenomenological experience of the asylum, will form the principal case study of this paper. In particular, the ethics of representing mental illness and historical mental health institutions in videogames will be questioned.

Just as 'The Town of Light' invites a player to experience a particular interpretation of Ospedale Psichiatrico di Volterra, the term dark heritage is prescriptive when applied to archaeological sites. This paper will conclude by considering the potential of videogames to represent and redefine dark heritage.

09 CREATING PLOTS AND AUTHENTICITY: ANALYZING VIDEO GAMES AND THEIR USE OF ARCHAEOLOGY AS FOLKLORE

Author: Thomas, Katherine - HELIX Environmental Planning, Inc.
Co-Author: Idol, Coy - William & Mary Center for Archaeological Research (Presenting author)
Keywords: Public Archaeology, Games
Presentation Preference: Oral

Video games are a combination of visual, auditory, and participatory performances. Approaching video games from a performance perspective allows for the use of theoretical perspectives developed by other disciplines that interpret performances. One such discipline that has a close working relationship with archaeology is folklore. By analyzing video

games as a modern form of folklore, we can apply a folklorist perspective on how and why archaeology is used in games. This perspective provides information on archaeology, not only as a plot device, but also on how it is used to create a more authentic gaming world. With this information, we will have a better understanding of the context with in which the video game community is exposed to archaeology, and be able to craft an improved dialogue with the gaming community.

10 SOCIAL OBJECTS IN THE DIGITAL WORLD

Author: von Ackermann, Megan - University of York (Presenting author)
Keywords: archaeogaming, objects, narratives
Presentation Preference: Oral

Locks and keys carry significant cultural weight. Their use creates categories and divisions between people, between objects, and between spaces. Throughout their history, therefore, they have accrued significant metaphorical meanings, meanings that extend to the afterlife and to religio-spirituality. These meanings are received through narrative transmission and expressed through both direct and indirect physicalisation.

This paper explores the ways in which this cultural inheritance is translated to suit the narrative and mechanical demands of game play, how a parallel culture of meaning and morphology has developed and branched through the taxonomy of game genres, and how in turn that culture may influence meanings and understandings of locks and keys, particularly as locking technology evolves.

11 GOBLINS, GRAVE DESECRATION, AND GREY AREAS: NAVIGATING GREY ARCHAEOLOGY IN GAMING THROUGH THE LENS OF WORLD OF WARCRAFT

Author: Ms Pageau, Hanna - University at Albany (Presenting author)
Keywords: archaeogaming, digital archaeology
Presentation Preference: Oral

Archaeology is a field with a troubled past and a methodology that can't always avoid grey areas, so how do those grey areas that come up in our every day practice (whether in the lab or the field), play out in representation of the field in games? This paper takes a look at those grey areas in the context of the representation of archaeology in the game World of Warcraft, particularly looking at representation of Archaeology as of the Warlords expansion and how archaeology has not only evolved within the game, but how new features introduced over the last three expansion packs have taken reality more into play.

12 THE ROLE OFTHE ARCHAEOLOGIST WHEN PRODUCING A SERIOUS GAME

Author: Ms. Morera, Núria - Universitat Autònoma de Barcelona (UAB) (Presenting author)
Co-Author: Dr. Piqué, Raquel - Universitat Autònoma de Barcelona (UAB); Dr. Barceló, Juan Antonio - Universitat Autònoma de Barcelona (UAB); Dr. Bogdanovic, Igor - Universitat Autònoma de Barcelona (UAB); Dr. López-Bultó, Oriol - Universitat Autònoma de Barcelona (UAB); Mr. Campana, Ivan - Universitat Autònoma de Barcelona (UAB); Dr. Palomo, Antoni - Universitat Autònoma de Barcelona (UAB); Mr. Revelles, Jordi - Universitat Autònoma de Barcelona (UAB); Dr. Terradas, Xavier - CSIC-IMF, Archaeology of Social Dynamics; Dr. Arcos, Josep Lluís - Institut d'Investigació en Intel·ligència Artificial (IIIA-CSIC); Mr. Cebrián, Sergi - Institut d'Investigació en Intel·ligència Artificial (IIIA-CSIC); Dr. Rodríguez-Aguilar, Juan Antonio - Institut d'Investigació en Intel·ligència Artificial (IIIA-CSIC)
Keywords: Serious game, Neolithic
Presentation Preference: Oral

In the frame of the research project undertaken in the site of La Draga, an Early Neolithic (ca. 5,300-4,800 cal BC) pile-dwelling settlement located at the North Eastern of the Iberian Peninsula, we are developing a serious game that recreates the life of a Neolithic community with the purpose of dissemination, entertainment and learning.
The videogame has tried to provide the most reliable narrative possible about Neolithic life. Therefore, it has been based on the results of the ongoing research at La Draga. This settlement is particularized for bearing an exceptional conservation and preservation of the archaeological organic remains. The consumption and production strategies fulfilled by the Neolithic society are extensively known as well as its environment. However, architecture is only partially known and no information exists regarding the appearance of Draga's inhabitants and neither about their customs. This absence of information has, firmly, constituted a challenge. The methodology followed, criteria used and how missing data has been treated are the objectives of this communication.

13 ARCHAEOLOGY IN CZECH VIDEOGAMES

Author: MA Šurinová, Miroslava - Charles University (Presenting author)
Keywords: archaeology, media
Presentation Preference: Oral

Archaeology is an often motive in Czech videogames. Especially in adventure games where the gamer is put in a role of an archaeologist. The Czech games are similar to the games from other countries; however they also have a certain level of uniqueness to them. In this paper I will discuss some aspects of presentation of archaeology in Czech videogames. Those aspects will be illustrated mainly, but not only, on a game Messenger of Gods, which was published in 1998, and its remake, which was published in 2005. The original version was released only in Czech Republic; however the remake was also translated into English and released internationally. The main focus will be on the accuracy and inaccuracies of archaeological work, the differences between depiction of archaeology in the late 20th century and early 21st century and the differences between depiction of local archaeology and archaeology of "exotic" civilizations.

14 VIDEOGAMES AND AUTOBIOGRAPHICAL HISTORIES

Author: Miss Hursthouse, Rebecca - University of Lincoln (Presenting author)
Keywords: Archaeogaming Entanglement Narratives
Presentation Preference: Oral

By identifying the entangled networks in which the narratives of historical video games are situated this paper examines the potential of these games to challenge established Histories and create inclusive narratives for marginalised identities. Michael Shanks described the historical narrative as 'The stories we write about ourselves' and the idea that history is used in, and is important to, the formation of self and identity is a common theme in Postprocessual, indigenous and heritage archaeology (e.g. Jenkins 1991, Smith, 2004; Hodder, 2012; Meskell, 2012).

The interactive nature of videogames and the reciprocal feedback of cause-and-effect typical in most forms of gameplay means the 'reader' has a greater capacity to create an autobiographical narrative compared to more traditional forms of delivery. Some games present choices which enable players to represent themselves in a particular way within the narrative; through tailored avatars, gameplay style and decision making and interactions with scripted actors. This allows for story-telling which more personally reflects the worldview of the player, thus allowing for greater representation of marginalised identities within an otherwise mainstream media. If this relationship with the medium is reproduced when the narrative is set within a historical context, then the ways in which people interact with videogames can develop modes of thought which begin to oppose the concept of a singular History.

The histories presented within games however, like all histories, are written to a purpose, when games are often produced by commercial identities it is necessary to understand the influences shaping these narratives before presenting videogames as a democratising force for minority voices. Ian Hodder's Entanglement theory is used to identify the network of dependencies surrounding the historical narratives of games in order to understand how effective an approach such games might be in affording resistant readings of History.

15 A SINGLEPLAYER, STRATEGIC AND ATMOSPHERIC, INDIE ACTION-ADVENTURE WITH MULTIPLAYER, A GREAT SOUNDTRACK AND MOSTLY POSITIVE REVIEWS: ANATOMY OF AN ARCHAEOGAME

Author: MSc Ariese-Vandemeulebroucke, Csilla - Leiden University; The VALUE Foundation (Presenting author)
Co-Author: Mr. Boom, Krijn - Leiden University; The VALUE Foundation; Ms. Copplestone, Tara - University of York; Aarhus University; Dr. Mol, Angus - The VALUE Foundation; Mr. Politopoulos, Aris - Leiden University; The VALUE Foundation
Keywords: Archaeogame, data-mining, crowdsourcing
Presentation Preference: Oral

Research at the intersections of archaeology and video games is part of a relatively recent and organically growing field. This has engendered much creativity and innovation, but also leads to some issues in pinning down what this burgeoning discipline is actually about. Whilst several researchers in the area have developed a working definition for what broadly constitutes an 'archaeogame,' this definition is rooted in what it could be, rather than in the reality of the most common anatomy of currently released archaeogames. This paper uses the power of the crowd to source a network of game genres, mechanics, features and other traits that are shared by games in the archaeogame-family. The jumping off point for this data-driven exploration is an archaeogame list, collaboratively compiled by a number of specialists in the field. Player-defined tags and reviews of these games have been collected with the use of a webcrawler which gathered this data on Steam, the world's leading PC game distribution platform. The authors compared the statistics and keyword-tags applied to games on the list to those of other categories of games, such as "historical" or "top-selling."
Current implementations of archaeogames undoubtedly have a large role in influencing creators, consumers, and academics alike. By unpicking the anatomy of archaeogames in this way, a network of concepts can be established which speaks to the wider world of game development practices, while also providing a platform from which more effectual critique and understanding of archaegames can manifest. The discussion prompted by this paper will be continued at the round table session #309 "At the Game Table."

277 MEDIEVAL RITUAL AND VOTIVE DEPOSITS

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Prieto-Martínez, M. Pilar (Spain) - Universidad de Santiago de Compostela
Co-Author(s): Tente, Catarina (Portugal) - Universidade Nova de Lisboa
Keywords: Medieval Ages, Votive deposits, Pottery
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Although Medieval Archeology has a long tradition in Europe, there are still certain aspects that have not been explored in any great detail, and which are little known from the archaeological record, such as votive deposits. These are ritual deposits associated with religious rites, but outside of the strictly funerary sphere.
The territory, habitats, burials, and production areas are well known in many regions; historical documentation contributes towards contrasting archaeological data, and archaeometric techniques have also proved useful for medieval periods. However, it can be more difficult for archaeologists to recognize the ritual materiality, as the relationship between the religious and the mundane is incapable of defining their limits. The typological studies in the literature are not intended to define these types of contexts, and mainly focus on faunal records found in dwellings or churches. It is interesting to consider the documentation of medieval materials in prehistoric sites (megalithic tombs or Iron Age hill forts), which have only been rarely investigated, which are not only the result of sporadic activities, and could aspects that connect Christianity with previous belief systems.
Our aim is to bring together studies that define these medieval votive deposits at European level, with a special focus on votive deposits with pottery. Religion has an important effect on the population, which has to be transferred into rituals and material evidence associated with them. Studying these deposits can help us to obtain a deeper understanding of this social and religious context.

01 FROM MAGICAL POTS TO HORSE SKULLS AND SACRIFICED DOGS - RITUAL DEPOSITS AT RURAL SETTLEMENTS IN EARLY MEDIEVAL HUNGARIAN KINGDOM

Author: Szabó, Dénes - Ópusztaszer National Heritage Park (Presenting author)
Keywords: deposition, witchcraft
Presentation Preference: Oral

During the decades long archaeological research of early medieval rural settlements throughout the Carpathian Basin numerous ritual deposits were found, the scholarly interpretions of which sometimes differed greatly. Common lack of data about their exact archaeological context also left them open for predetermined opinions. Were they building sacrifices or part of fertility rituals? Can they be seen as remains of "heathen" belief systems, or do they mirror superstitions of medieval folk Christianity - or witchcraft? Can some of the dog sacrifices be attributed to Kipchaks, and thus have an ethnical aspect?
Instead of looking for exclusatory answers we must see such findigns in a broader context, considering their numerous Bronze and Iron Age paralels and relations with Christian simbolism as well.

02 CHICKEN, POTS AND RITUAL DEPOSITS: FOLK RELIGION AND SOCIO-POLITICAL IDENTITIES DURING THE HIGH MIDDLE AGES IN THE BASQUE COUNTRY (SPAIN)

Author: Dr. Grau-Sologestoa, Idoia - University of the Basque Country; University of Sheffield (Presenting author)
Co-Author: Prof Quirós Castillo, Juan Antonio - University of the Basque Country
Keywords: medieval, Christianity, foundation
Presentation Preference: Oral

In this paper, a particular type of unusual archaeological deposits found at some high medieval (12th-13th centuries AD) sites located in the Basque Country (northern Iberia) is examined. These structured deposits consist of inverted pottery vessels containing the remains of a chicken, placed in pits created on purpose for keeping them, and are generally found in archaeological contexts related to the foundation or reconstruction of public buildings, including churches and city walls. The implications of the occurrence of extra-"official" rituals in Christian contexts are discussed in the framework of folk religion, suggesting that medieval religion was hybrid and dynamic, even after the Gregorian Reform (11th century AD). The co-existence of normative consecration forms made by ecclesiastical authorities (remembered through commemoration inscriptions or texts), and by ritual deposits associated to foundation practices, is analysed in this paper from a contextual and significant perspective. We suggest that the occurrence of such public ritual practices in the Basque Country during the High Middle Ages might be related to the formation and negotiation of new social and political communities.

03 THE RITUAL POTTERY DEPOSIT OF ROZA DAS AVEAS (OUTEIRO DE REI, LUGO)

Author: Prieto Martínez, Pilar - University of Santiago de Compostela (Presenting author)
Co-Author: Alonso Toucido, Francisco - University of Santiago de Compostela; Estela Arqueoloxia e Patrimonio; Lantes Suarez, Oscar - University of Santiago de Compostela; Vazquez Liz, Pablo - Professional archeologist
Keywords: ritual medieval deposit
Presentation Preference: Poster

Mediaeval pottery is a topic that has begun to be investigated in Galicia. Apart from vessels documented in settlements or burials, collections of pottery are now being found in other contexts that are more difficult to interpret. One of the examples that has been recently documented has led us to consider the re-use of prehistoric sites as a spatial landmark. We present a series of mediaeval vessels that were deposited on the edge of a megalithic barrow, verifying by means of a formal and contextual description, as well as by analysing the mineralogy and elemental composition of the clays, that this is a ritual deposit, in which an element from the past –the burial mound– may still have been important, as also revealed by the abundant folklore associated with tumuli in Galicia.

04 RELIGIOUS BELIEFS AND RITUAL PRACTICE; THE DEPOSITION OF PRECIOUS METAL JEWELLERY IN MEDIEVAL SCOTLAND.

Author: Mr Campbell, Stuart - National Museums Scotland (Presenting author)
Keywords: Medieval Votive Jewellery
Presentation Preference: Oral

Finds of medieval jewellery are commonly discovered both through excavation and metal detecting and are usually interpreted as chance losses that have not been recovered by the individual who lost them, an assumption made, in part, on the basis that the objects have an inherent monetary value that would make their recovery a priority. This paper will argue that these objects should be considered instead as representing individual acts of votive deposition. This pattern has been hard to distinguish as these objects are found in contexts wholly unrelated to accustomed medieval religious or ritual practice.

While chances losses of objects undoubtedly do occur, this paper will analyse a significant corpus of 13th-14th century jewellery that bear religious inscriptions and where context and type would indicate deposition occurs as an act of personal devotion or as mediation between everyday life and religious practice. The objects involved are items of a personal nature such as rings and brooches and the over representation of the types in these contexts and their underrepresentation elsewhere in the archaeological record would suggest they should be analysed and treated as a distinct phenomenon.

The paper will also consider the assumptions surrounding religious practice and artefact context that can make it difficult to identify such patterns, and use understood patterns of pilgrim badge and ampulla offerings that allow us to consider other objects in the same light. In addition it will aim to address the key question of how we can identify acts of votive deposition outside conventionally identified religious and ritual sites.

05 RELIGIOUS RITUALS IN THE BASILICA OF AUGAS SANTAS (ALLARIZ, NW IBERIAN PENINSULA): THE POTTERY DEPOSIT

Author: Prieto Martínez, Pilar - University of Santiago de Compostela (Presenting author)
Co-Author: Lantes Suarez, Oscar - University of Santiago de Compostela; Alonso Toucido, Francisco - University of Santiago de Compostela; Estela Arqueoloxia e Patrimonio; Iglesias, Alfredo - University of Santiago de Compostela; Silva, Jesus - University of Santiago de Compostela
Keywords: Medieval vessels Galicia,
Presentation Preference: Oral

We present a collection of pottery from Augas Santas, consisting of 122 vessels. A total of 16 pieces representing the four different morphological types we classified were analysed using X-Ray Diffraction (XRD), X-ray fluorescence (XRF) and Cone beam computed tomography (CBCT). This is a very uniform group of vessels in typological and analytical terms, and with regard to their operational chain. The results lead us to believe that the pottery was probably commissioned from a specific potter or workshop, with this activity forming a part of the religious rituals of the time. Our aim is to show how the manufacturing processes can help towards interpreting these types of contexts.

279 FORTIFICATIONS, NETWORKS AND LANDSCAPES: THE CHALLENGE OF HIGH-DEFINITION ARCHAEOLOGY

Theme: 6. Interpreting the archaeological record
Author: Sindbæk, Søren Michael (Denmark) - Aarhus University
Co-Author(s): Segschneider, Martin (Germany) - Lower Saxony Institute for Historical Coastal Research, Wilhelmshaven
Keywords: Fortifications, defense, remote-sensing, geophysics
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

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The study of early historic or prehistoric fortifications has entered a decisive new turn in recent years. Strategies combining high-definition remote sensing, geophysical survey, targeted small-scale excavations and high-precision dating methods are increasingly providing decisive knowledge with minimal damage to the scheduled monuments. A great number of hillforts and large earthworks across Europe that have previously often defied research, are thus increasingly characterized in terms of precise typologies, based on detailed geophysical investigation and other data-rich mapping; they can be related to specific historical situations through precision chronology; and systems of regional defense can be credibly compared between regions. As a result, recent research has increasingly seen early medieval defense works as strategically effective responses to specific military challenges.
The discoveries of greater network of fortress sites contribute to show how elites exercised control of a landscape, with major symbolic implications as well as practical value. Networks of fortifications displayed ability to command and organize significant manpower and resources, at the same time as offering major strategic benefits: the ability to anticipate threats, creating an early warning system, gathering defense at short notice and securing supplies and reinforcements by land and sea routes. High-definition fortress-archaeology now allows discussions on events, strategy and causation that were once the sole domain of historians.
This session invites presentations that focus either on new investigations of specific sites, comparisons between military networks, or discussions on the symbolic or practical aspects of prehistoric or early historic fortification systems.

01 AGGERSBORG - A VIKING AGE RING FORTRESS IN NORTH JUTLAND, DENMARK

Author: Dr. Nielsen, Bjarne Henning - Vesthimmerlands Museum (Presenting author)
Keywords: viking, village, fortification,
Presentation Preference: Oral

A few years ago the Viking Age ring fortress Aggersborg was published by Else Roesdahl and Søren Sindbæk. But since then further excavations have been conducted to try to clarify new questions concerning the size of the village beneath the fortress. Could a more detailed description of the topography in the surroundings give an even better understanding of why this place was chosen. What picture do we see when we add five years of intense work by a group of dedicated metaldetector people?

02 TRACING CENTRALITY: BRONZE AGE HILLFORTS AS ACTORS IN NETWORKS

Author: M.A. Linde, Lennart - Goethe University Frankfurt (Presenting author)
Keywords: Hillforts, Networks, ABM
Presentation Preference: Oral

Patterns of interaction and the analysis of corresponding networks have start to become a more widely used approach in current archaeology. Regarding fortifications the Bronze Age hillforts of southern Germany are a subject worth applying this method to. In most archaeological narratives hillforts are dubbed as central places which amass social, economic and military power. But these narrative is rarely put to test by a quantified approach. The presentation will discuss the research design and preliminary results of a micro scale study regarding the relationship between Bronze Age settlements and hillforts. The aim is to trace processes of centralization in a bottom up approach through shifts in the micro region surrounding the hillforts. The study utilities an agend based model (ABM) to generate a network graph wich can be analyzed through the toolset of social network analysis (SNA). The ABM allows to manipulate the push factors towards the hillforts and therefore sheds new light on the dynamics within their surrounding territory.This network centric approaches are about to get complemented with spatial applications like triangulations, viewsheds, determination of soil use and path cost calculations. A close evaluation of changes within the dynamics in spatial organization and social networks are supposed to give insights into the process of centralization. What does really change when a hillfort rise? Which pattern can we identify? Is high definition archaeology possible on the micro scale at all?

03 NEW INVESTIGATIONS IN THE TRANSITION ZONE: CONSIDERING A MULTI-DITCHED SETTLEMENT IN WESTERN SICILY AS A NODE IN A COMPLEX LANDSCAPE

Author: Dr. Sevara, Christopher - University of Vienna (Presenting author)
Co-Author: Dr. Doneus, Michael - University of Vienna; LBI ArchPro; Dr. Draganits, Erich - University of Vienna; LBI ArchPro; Frazzetta, Cipriano - University of Vienna; Dr. Tusa, Sebastiano - Soprintendenza del Mare, Regione Siciliana; Totschnig, Ralf - Zentranstalt für Meteorologie und Geodynamik; Schilk, Sheba-Celina - University of Vienna; Cusumano, Rosa - Prima Archeologia del Mediterraneo - PAM; Palermo, Barbara - Prima Archeologia del Mediterraneo - PAM; Pisciotta, Filippo - Prima Archeologia del Mediterraneo - PAM; Stallone, Rosmaria - Prima Archeologia del Mediterraneo - PAM; Valenti, Antonina - Prima Archeologia del Mediterraneo - PAM
Keywords: archaeological-prospection, Sicily, settlements
Presentation Preference: Oral

This paper will present results from recent work on the Prospecting Boundaries project (http://mazaro.univie.ac.at), which seeks to explore the diversity of land use in the region along the Mazaro river corridor in western Sicily through the use and improvement of integrated archaeological prospection techniques. One key research area within the project boundaries is the site of Guletta, an area of dense multiperiod activity situated on the plain above the Mazaro gorge. In 2004, a large multi-ditched fortification structure was identified at Guletta during an aerial photography campaign carried out by the University of Vienna Aerial Archive. In 2016, geophysical prospection in the area revealed a number of subsurface features, and results from corresponding in-field survey and artefact analysis indicate the possibility of human occupation from at least the 8th to 6th centuries BC. At the multiperiod site of Roccazzo, 3 km to the east-northeast of Guletta on the opposite side of the river, there is evidence of activity from contemporary periods. Did these easily defensible, intervisible sites also come to serve as central areas of activity and cultural boundary markers during a period of growing external influence in the west of Sicily? If so, how does that fit with current concepts of land use and interaction in the region, particularly during the Bronze and Iron Ages? Work at Guletta has been conducted in conjunction with a wider interpretation of the landscape around the Mazaro river corridor, based on the use of airborne laser scanning (ALS), historical maps, and aerial imagery coupled with in-field survey and evaluation of existing site information. Relict traces of transport activity connect these areas, and the nature of these and their possible use in different periods is helping us to build a picture of past movement between nodes of activity from the coast to the interior.

04 MESSAPIAN FORTIFICATIONS DURING THE HELLENISTIC PERIOD. THE CASE OF MURO TENENTE

Author: Professor Burgers, Gert-Jan - Free University Amsterdam (Presenting author)
Co-Author: merlino, matteo - university of Amsterdam; Lengkeek, Selma - free university amsterdam (Presenting author)
Keywords: fortification, 3d
Presentation Preference: Oral

The external fortifications that enclose the fifty hectares of the Messapian site of Muro Tenente have been and are still now a remarkably visible landmark in the northern countryside of Salento. The construction of this impressive defensive system, probably during the IV century B.C., marks the demographical boom of the settlement and its transformation into an urban site. The fortification complex was also completed by the restoration of the archaic walls which enclosed the acropolis of the site. The result was a clear division between the old and the new settlement which seems to suggest interesting social developments inside the local community. Beyond its social implications, the fortifications of Muro Tenente fulfilled also a clear defensive duty, as testified by their last restoration, made using grave covers, just before the second Punic war. This paper will present the latest results coming from the study of this important landmark, conducted by the Free University of Amsterdam, over the past decade. The emphasis will be given to the different methodological and technical approaches followed in order to understand this complex structure (archaeological excavation, survey, lidar and drone photography) while the conclusion will address the problems of its (virtual) reconstruction and conservation.

05 THE UNFORTIFIED IRON AGE

Author: Heijnis, Arjen - Aarhus University (Presenting author)
Keywords: Fortifications, Iron_Age, Southern_Scandinavia
Presentation Preference: Oral

The new methods introduced in the session presentation have led to a new understanding of cross-regional comparison of fortification of the prehistoric period. This also led to a re-evaluation of previously understood patterns of fortification beyond the simple use of fortifications as proxy for a stage on an evolutionary ladder of social complexity, and towards and understanding of fortifications as a functional, practical element of military infrastructure. In other words, we can now approach the question of 'why' and 'how' of fortifications.

In this context, in my PhD project I investigated the fortifications of Southern Scandinavia before the Viking age. It was assumed, on the basis of martial indications and cross-regional parallels, that fortifications should be common in this region and time, but the archaeological support for this assumption has been lacking. On the basis of a re-evaluation of the available archaeological evidence from 197 possible sites I conclude that fortifications were rare and not a standard element of defensive infrastructure between the Roman and Viking periods.

This fits (surprisingly?) well with our current understanding of social organization and its dynamics during the first millennium AD, not only in Southern Scandinavia but in all North-Western Europe. Crucial here is the interpretation of warfare and battle as symbolic acts, and thus bound by cultural norms. With this realization, the distinction between a 'military' and a 'ritual' interpretation of archaeological sites dissolves.

06 ROUND RIDDLES

Author: Dr. Segschneider, Martin - Lower Saxony institute for historical coastal research (Presenting author)
Co-Author: Mr. Majchczack, Bent - Lower Saxony institute for historical coastal research
Keywords: ramparts, islands, geophysics
Presentation Preference: Oral

The well-preserved early medieval ring-shaped ramparts on the North Frisian Islands and the settlements in their surroundings have been studied in the last years with a bundle of methods, amongst them geophysics, laser-scanning and archaeological excavations. The rich and surprising results changed the perception of the ramparts dramatically and

lead to a much better understanding of their function and placement within a historical maritime landscape. Their placements within a possible large-scale defense system along the southern Scandinavian realm will also be discussed.

07 STATE FORMATION IN THE LANDSCAPE : THE RINGFORTS OF FLANDERS AND ZEELAND (850-950)

Author: Dr. Tys, Dries - Vrije Universiteit Brussel (Presenting author)
Co-Author: Dr. Deckers, Pieterjan - VUB; Dr. Wouters, Barbora - VUB
Keywords: stateformation, Flanders, interdisciplinary
Presentation Preference: Oral

The ringforts in Flanders and Zeeland have traditionally been regarded as a single event in the landscape of coastal Flanders. The narrative of historians and archaeologists associated them with refugee camps in the time of the campaign of the Viking Great Army of 878-891. The re-assessment of archaeological information of many of those fortifications allows us to re-interpret them in the context of processes of state formation in the southern Low countries. Some ringforts had for instance clearly a similar symbolic and strategic significance as the Burghall Hidage fortifications in Wessex and Mercia. The general re-assessment of their chronologies and roles allows us to see them as important markers in new landscapes of power in the chaotic period between the middle of the 9th and the middle of the tenth centuries.

08 THE DANEVIRKE IN THE LIGHT OF THE RECENT EXCAVATIONS

Author: Witte, Frauke - Museum-Sonderjylland - Arkaeologi Haderslev
Co-Author: Dr Tummuscheit, Astrid - Archäologisches Landesamt Schleswig-Holstein (Presenting author)
Keywords: Danevirke, fortification, earthwork
Presentation Preference: Oral

The Danevirke is a 35 km large system of ramparts, ditches and underwater hindrings from different phases of time. Mostly known it is for the Viking age settlement "Haithabu/ Hetheby" with is circular rampart.
In the years 2010-2014 archeological excavations discovered a gate in 2010 in the main rampart of Danevirke. The recent excavations also gave new insights into the age of the oldest building phases which made the former border between the regions that later became Germany and Denmark at least 200 years older. Also there was found an expansion during the Middle Ages, roads, moats and other details, all of which increase our existing understanding of the defense complex. In the gate area, it appears that there is a special building technique which hints that the Viking age stone wall had two phases. In addition are the presences of tracks in the sand deposits within the gate opening, resembling those from Viking Age wagons.
The paper will present the latest excavation and research results.

09 THE DISCOVERY OF BORGRING - A VIKING-AGE RING FORTRESS

Author: Curator Gade, Nanna - Museum Southeast Denmark (Presenting author)
Keywords: Viking-Age ring fortress
Presentation Preference: Oral

Borgring is the first Viking-Age ring fortress to be discovered in Denmark for six decades. The discovery demonstrates the strength of a strategy combining high-resolution LIDAR mapping, geophysical survey and targeted excavations in providing decisive knowledge.
The ring fortresses of the Trelleborg-type are all laid out to a strikingly similar geometric plan, and were built in a short period around AD 975-80, in the reign of King Harald Bluetooth, in a part of Europe with little precedent for large-scale fortified sites.

Museum of Southeast Denmark/the Danish Castle Centre and the University of Aarhus has initiated a three-year research project with focus on the fortress architecture, the use, dating and historical context. In addition the fortress surroundings, transportion/infrastructure, a reconstruction of the landscape, relations with the region's topography and Viking Age settlements locally and regionally.

The discovery of Borgring has given us a new opportunity to reveal new details of the plans and construction of the fortresses and a deeper understanding of the greater network between the other fortresses and the interaction with local settelments.

10 NON-INTRUSIVE METHODS FOR CHARACTERISING HABITATION AT FORTIFIED SITES.

Author: Stott, David - Institut for Geoscience, Aarhus University; Moesgaard Museum (Presenting author)
Co-Author: Munch Kristiansen, Søren - Institut for Geoscience, Aarhus University; Centre for Urban Network Evolutions (UrbNet), Aarhus University; Prof Sindbæk, Søren - Centre for Urban Network Evolutions (UrbNet), Aarhus University; Medieval and Renaissance Archaeology, Aarhus University
Keywords: geochemistry, prospection, geophysics
Presentation Preference: Oral

Fortified sites present unique challenges for archaeological prospection. While the substantial banks and ditches forming the fortifications are easy to detect in both remotely sensed and geophysical data, habitation at these sites can be brief and difficult to characterise using non-intrusive methods. In particular, establishing whether a site was intensively occupied for any length of time can be problematic.
The five Viking Age ring castles in Denmark are a good example of this. Occupation at most of these sites appears to have been relatively short-lived. This combined with difficult geological conditions make resolving the internal features of the forts problematic using geophysical methods, and these methods provide little indication of the duration or intensity of habitation.
In this presentation, we will review airborne and terrestrial prospection methods used at these Danish sites and what they resolved. We will then go on to present how these methods can be complemented using soil mapping and laboratory techniques to measure relative quantities of key elements indicative of human habitation. In particular, the combination of soil mapping and the use of Inductively Coupled Plasma Mass Spectroscopy (ICPMS) and Near Infrared Spectroscopy (NIRS) on soil samples afford the possibility

of investigating a wide variety of different elements simultaneously. These methods were used at the recently discovered site Borgring, near Køge, Denmark, to intensively sample the A-horizon within and without the fort, and demonstrate that they provide additional insight to the geophysical results.

11 MEDIEVAL RUSSIAN CITY FORTIFICATION: RAMPARTS OR WALLS?

Author: PhD Koval, Vladimir - Institute of Archaeology RAS (Presenting author)
Keywords: Medieval fortification
Presentation Preference: Oral

To this day Medieval Russian city fortification preserved as ramparts (earthen ridges) in height from 2 to 15 m. Previously, archaeologists considered them as a specially erected embankments, on top of which they suggested wooden fortifications in the form of palisades or carcass walls. Sometimes excavators found inside ramparts the remains of a wooden constructions, but often the wood is completely rotted and then it seemed there had never been any wood. Only modern methods of fixation and microbiological studies have shown that the wooden structures were within ALL ancient Russian "ramparts". Until recently, these remains were perceived as means for "strengthen" the rampart. However, no one hard internal construction can't to "strengthen" the earthen mound, it strengthens by the turf on its surface only. Wooden "structures" created always only in oak, i.e. the most expensive and valuable timber. Today it is clear that the "ramparts" around the ancient city are the remains (ruins) of wooden walls composed of oak cabins (square modules), the inner cavity of which filled with earth. If wooden "paneling" of walls were destroyed (burned in the fire, simply rotted, or destroyed by other means), the earth crumbled, and on-site wall arose "rampart". This new interpretation of ramparts has not yet become common in Russia, but each new object of archaeological study of "ramparts" brings further confirmation of this hypothesis.

280 WORKING IN THE DARK? DEALING WITH NATURAL AND HUMAN THREATS TO BURIED ARCHAEOLOGICAL SITES.

Theme: 2. The Valletta Convention: the next 25 years
Author: Huisman, Hans (Netherlands) - Cultural Heritage Agency of the Netherlands
Co-Author(s): Williams, Jim (United Kingdom) - Historic EnglandMatthiesen, Henning (Denmark) - National museum of DenmarkGroenendijk, Maarten (Netherlands) - Gouda municipalityNgan-Tillard, Dominique (Netherlands) - Delft Technical UniversitySidell, Jane (United Kingdom) - Historic England
Keywords: Preservation, degradation, monitoring, mitigation
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Signed 25 years ago, the Valletta treaty places a strong emphasis on the protection of archaeological sites. Because of acute threats of archaeological site destruction by construction activities, a major result was a massive increase in rescue and preventative excavations on threatened sites. The Treaty also proposed that heritage assets should be preserved in situ, where feasible, and recommended member states share knowledge and training on this subject. Over the past 25 years a range of pilot projects and detailed one-off studies on specific sites have been conducted across Europe.

In this session, we will discuss new insights we have gained into human and natural threats to archaeological sites, and practical ways to deal with them, including a) assessing and limiting the impact of construction on archaeological sites, e.g. the effects of piling and loading; b) determining the effects that agricultural practices, nature conservation projects and other rural land-use change have on archaeological sites and what mitigating measures are possible; c) developing and future-proofing protective measures and dynamic schemes for site protection; d) monitoring and assessment of the state of preservation of archaeological sites and materials, especially with regard balancing high-tech intense monitoring on few with low-tech extensive monitoring on larger numbers of sites; e) effects of climate change on the preservation of archaeological sites.

01 INTRODUCTION TO SESSION 280: WORKING IN THE DARK, PROTECTING OUR ARCHAEOLOGICAL HERITAGE

Author: Dr. Huisman, Dirk Johannes (Hans) - Cultural Heritage Agency of the Netherlands (Presenting author)
Co-Author: Drs. Groenendijk, Maarten - Municipality of Gouda; Dr. ir. Ngan-Tillard, Dominique - TU DELFT- Faculty of Civil Engineering and Geosciences; Dr. Sidell, Jane - HE - Historic England; Dr. Williams, Jim - Historic England
Keywords: Preservation, Monitoring, Guidelines,
Presentation Preference: Oral

Signed 25 years ago, the Valletta treaty places a strong emphasis on the protection of archaeological sites. Because of acute threats of archaeological site destruction by construction activities, a major result was a massive increase in rescue and preventative excavations on threatened sites. The Treaty also proposed that heritage assets should be preserved in situ, where feasible, and recommended member states share knowledge and training on this subject. Over the past 25 years a range of pilot projects and detailed one-off studies on specific sites have been conducted across Europe. In this session, we will discuss new insights we have gained into human and natural threats to archaeological sites, and practical ways to deal with them.

Several themes can be identified that will be addressed in presentations in this session

In the theme safeguarding, monitoring and assessment, a common thread is linking the archaeological remains on a site with measurements and knowledge about degradation processes in order to assess threats and the feasibility of mitigation. Accessability and visibility also plays a role here.

To make this possible, fundamental knowledge about the impact on burial conditions and human activities is needed. A second theme in this session consists of research projects that aim at providing such fundamental knowledge. Serious attention is given to the impact that construction activities can have on the buried archaeological remains. But there is also attention for the more gradual processes of organic matter decay and erosion.

The session is closed with a presentation that looks back on past projects to learn from successes and mistakes, and guidelines for preservation in situ will be presented.

02 MONITORING ARCHAEOLOGICAL MONUMENTS: GOALS, METHODS, RESULTS AND PUBLIC INFORMATION

Author: Drs Schreurs, José - Cultural Heritage Agency of the Netherlands (Presenting author)
Co-Author: Dr Van Os, Bertil - Rijksdienst voor het Cultureel Erfgoed; Drs Van der Heiden, Menno - Rijksdienst voor het Cultureel Erfgoed; Drs De Kort, Jan Willem - Rijksdienst voor het Cultureel Erfgoed
Keywords: monitoring, monuments, public-information
Presentation Preference: Oral

In the Netherlands, about 1450 archaeological monuments are listed. Being a densely populated country makes sustainable management and conservation of archaeological monuments quite a challenge. In order to monitor the condition and sustainability of our protected archaeological sites we devised a monitoring program. Not only site assessment and conservation measures are goals of this scheme, but also informing the public about status and value of our cultural heritage. In order to achieve this, monitoring results are presented on the national cultural heritage monitor.
Our monitoring scheme consists of a baseline study, including visual inspection, land use, soil environment and burial conditions assessment by augering, and desk study (former investigations, historical maps, actual height model).
In this paper we present our monitoring method and first results and how these are presented to the public.

03 PROTECTION OF BURIED AND SUBMERGED ARCHAEOLOGICAL SITES IN LAKE PEIPSI.

Author: Ms Roio, Maili - National Heritage Board of Estonia (Presenting author)
Keywords: submerged sites, protection
Presentation Preference: Oral

Since 2012, archaeological survey has been conducted in the northern and north-western parts of Lake Peipsi. During the survey, the artefacts from Stone and Bronze Age settlement and burial sites, were found. The majority of the material was found in autumn 2015, when dredging operations were conducted in the lake near the mouths of several rivers. Small harbours have been established to the mouths of most of the rivers flowing into Lake Peipsi. The harbour developments are planned mostly from EU support funds also in the current period. Even though we hold new data of archaeological sites from those areas, it is complicated to evaluate their scope and preservation condition without conducting interdisciplinary research which is much more time consuming.
At the same time, it is expected that the management authority would be able to provide so called ready packages regarding further activities. Today we lack the practical experience concerning the physical protection of archaeological sites in the harbour development areas and therefore we try to implement methods that have been tested elsewhere. What are the methods we can choose from and which ones could we use? What could be the compromises in the light of Valetta treaty?

04 ALL ALONG THE WATCHTOWERS! BALANCING HERITAGE PROTECTION AND DEVELOPMENT OF CASTLE SITES WITH SCIENTIFIC RESEARCH POTENTIAL OF BURIED ARCHAEOLOGY

Author: Banerjea, Rowena - University of Reading (Presenting author)
Co-Author: Huisman, Hans - Cultural heritage agency of the Netherlands; Nicosia, Cristiano - CReA- Université de Bruxelles; Colenberg, Jesper - Self employed; García-Contreras Ruiz, Guillermo - Universidad de Granada; Pluskowski, Aleks - University of Reading; Van Dijk, Xavier - RAAP; Van Doesburg, Jan - Cultural heritage agency of the Netherlands
Keywords: Geoarchaeology, Heritage Management
Presentation Preference: Oral

Successive waves of conquest and colonisation throughout the Middle Ages have shaped society and the cultural geography of modern Europe. Castles and their remains are iconic remnants from that period, and as such form an important part of our cultural heritage. Across Europe, only recently is the scientific potential of the buried archaeological deposits within castles being realised, which can be overlooked in favour of the protection and consolidation of standing remains, and developments such as reconstruction and rebuilding projects.
This paper presents a review of the state of archaeological remains within medieval castle sites across Europe (Estonia, Latvia, Poland, Italy, Spain and The Netherlands), their scientific value and potential threats to the buried archaeology based on geoarchaeological research.
No standing remains survive at Karksi and Elbląg (Estonia and Poland) but both sites contained exceptionally well preserved waterlogged occupation deposits dating to the Crusades - to the initial colonisation period. In Elbląg and Kessel (The Netherlands), excavations were done ahead of development. They are examples of sites where different heritage perspectives had to be balanced due to development and rebuilding. In the Baltic, Dutch and Italian examples, micromorphology was instrumental in discovering that buried deposits contained the remains of (probably wooden) buildings from a first construction phase, or in the characterisation of re-use occupation following the decay of structures.
Molina de Aragón (Spain) is located in a UNESCO geopark. Geoarchaeological samples were collected recently from profiles created during previous excavations, which were conducted to support the architectural restoration but without a scientific focus on the medieval stratigraphy.
These examples highlight the importance of a geoarchaeological perspective for both identifying and conserving cultural deposits within castles. They not only demonstrate the archaeological value of buried archaeological deposits, but also stress the threats to them due to development, rebuilding, and conservation.

05 THE TWO PLAYHOUSES OF SHOREDITCH. CHALLENGES OF CONSERVING AND PRESENTING SHAKESPEAREAN ARCHAEOLOGY IN THE URBAN ZONE.

Author: Dr Sidell, Jane - HE - Historic England (Presenting author)
Keywords: Conservation, Shakespeare, Urban
Presentation Preference: Oral

The discovery of Shakespeare's Rose Theatre in 1989 sparked a worldwide debate about the preservation of remains associated with one of Britain's most iconic figures. Yet the preservation of the site has proved controversial and as yet, the site remains 'unfinished'. In the last few years, the remains of The Theatre, and the Curtain Theatre have been discovered and huge enthusiasm exists for their preservation but also display.

This paper will outline the challenges and pressures faced when attempting to 'fit' fragile remains into new developments, given the demand for land in the urban zone, and the turnover of building stock. The paper will also explore the tensions between conservation of remains, and providing visible access for the public.

06 SHINING A LIGHT ON THE EFFECTS OF ENVIRONMENTAL CHANGES ON THE PRESERVATION OF ORGANIC MATERIALS: AN ANALYTICAL APPROACH

Author: Dr High, Kirsty - University of York (Presenting author)
Co-Author: Dr Penkman, Kirsty - University of York; Dr Williams, Jim - Historic England; Mr Panter, Ian - York Archaeological Trust
Keywords: Assessment, preservation, inter-disciplinary
Presentation Preference: Oral

Potential threats to archaeological sites preserved in situ are determined by both the environmental parameters of the burial environment and the state of preservation of any material present. 25 years of research into preservation in situ has furnished us with a wealth of knowledge, but the direct consequence of changes in these parameters on the degradation of organic remains can be difficult to decipher. This is largely due to the complexities of the diagenetic pathways involved.

Our recent research at Star Carr applied a range of analytical techniques to assess deterioration in bone and wood, and link this to geochemical changes at the site. We demonstrated that material already heavily degraded is at risk of incredibly rapid loss (within a year) if burial conditions change; a rate much greater than initially thought. Such approaches have the potential to significantly improve our understanding of how changes in the burial environment directly affect the archaeological material. As analytical methods improve, the quality of this understanding will continue to enhance the data available when making site management decisions.

However, the application of high-end analytical techniques can depend on expert involvement, and coherent translation of that knowledge to the decision maker. This can sometimes lead to inconsistency in the level of detail obtained by condition assessment of the archaeological remains; this is often dependent on the people involved in the project, time constraints and cost pressures. If we are to use emerging techniques to their full potential, we therefore need better routes of communication between researchers and the heritage community.

In a multi-disciplinary project, we are now exploring how these barriers to communication can be overcome to ensure that appropriate methodologies are applied, taking into account the limitations faced by the decision makers assessing the potential for preservation in situ.

07 EROSION OF ARCHAEOLOGICAL SITES: QUANTIFYING THE THREAT USING OSL AND FALL-OUT ISOTOPES

Author: Dr. ir Huisman, Dirk Johannes (Hans) - Cultural Heritage Agency of the Netherlands (Presenting author)
Co-Author: Drs. de Kort, Jan-Willem - Cultural Heritage Agency of the Netherlands; Prof. dr. Ketterer, Mike - Metropolitan State University of Denver; Dr. Reimann, Tony - Wageningen University & Research; Dr. Schoorl, Jeroen - Wageningen University & Research; Drs. van der Heiden, Menno - Cultural Heritage Agency of the Netherlands; MSc van Soest, Maud - Wageningen University & Research; Loughborough University, UK; Drs. van Egmond, Fenny - MEDUSA Explorations BV; Wageningen University & Research; Prof. dr. Wallinga, Jacob - Wageningen University & Research
Keywords: Erosion, Isotopes, Multidisciplinary
Presentation Preference: Oral

Archaeological sites with surface topography or on slopes can be susceptible to different types of erosion, resulting in progressing damage to the site. Tillage increases this threat because of the stronger susceptibility to water erosion of barren, loose topsoil after ploughing but also due to direct soil displacement by agricultural implements. Although there is ample visible evidence erosion has damaged many sites, there is little or no data to assess rates of soil redistribution (e.g. in mm/yr). This makes it hard to determine scale and urgency of the threat of erosion.

Numerous techniques are available to measure soil erosion rates, each with its own pros and cons. Few of them, however, have been tested or used on the short timescales (years or decades) needed to assess erosion rates on archaeological sites. We selected three archaeological sites (Neolothic, Roman, Medieval) where erosion rates were expected to be high (plouighed loess slopes and artificial mound). We combined OSL-SAR dating and the distribution of fall-out isotopes to assess erosion rates:

A schematic depth-age representation of OSL-SAR single aliquot ages was developed that was found well suitable to determine past erosion and colluviation, but also to identify stable land surfaces on timescales of centuries and longer. Radioactive fall-out isotopes of cesium (Cs) and plutonium (Pu) were suitable for shorter time-scales: Pu isotope ratios and a positive Pu-Cs correlation showed that these isotopes were derived from the atmospheric nuclear tests of the late 1950'ies and early 1960'ies. The distribution of these isotopes in soil profiles could be used to estimate that erosion rates in the last c. 50 years; ranged from 2 - 6 mm/year on these sites.

08 PILES IN THE SPOTLIGHT. SHEDDING LIGHT ON THE DISTURBANCE CAUSED BY PILING.

Author: Doctorandus (Drs.) Groenendijk, Maarten - Municipality of Gouda (Presenting author)
Keywords: Piling Disturbance Photographs
Presentation Preference: Oral

A major threat to archaeological sites in situ, particularly in urbanized environments, is piling. In the past 25 years, disturbance caused by piling has been the topic of several research projects. However, these projects were small in number and many were done under laboratory conditions only. Fundamental questions on the disturbance caused by different types of piles in different soils therefore still remain. The size of the area of disturbance surrounding a pile and the factors that influence this area of disturbance are still significant lacunae. Also, the often mentioned assumption that replacement piles are less damaging than displacement piles is yet to be tested.

In this presentation, we will focus on these questions. Based on approximately 10.000 photographs of piles, taken during past excavations on redevelopment locations, a large dataset of field observations of soil disturbance surrounding piles was acquired. Analysis of this dataset has resulted in an overview of the area of disturbance caused by a variety of pile types and techniques, in various soil types. We will present these results and their implications. Discussion will be on estimating the loss of archaeological information due to piling and its associated soil disturbance.

09 MEASURING STRAIN ON BONE SAMPLES SUBJECTED TO COMPRESSION AND SHEAR STRESSES

Author: Leskovar, Tamara - Quinnipiac University (Presenting author)
Co-Author: Ass. Prof. Perez-Mejia, Ari - Quinnipiac University
Keywords: mechanical-loading, bone, stress-strain
Presentation Preference: Oral

While there has been an increase in research activity, the effects of mechanical loading on buried archaeological remains are still poorly understood. Because of the high variability inherent in the topic, as well as area being under-researched, there is a need to not only build a wide and reliable data set but also to develop appropriate and adjustable testing methodologies.

This paper presents research on the strain behaviour of bones in different preservation states buried in the soil and subjected to compression and shear stresses. The aim of this work was twofold. First, to gain new information on the stress-strain behaviour of the bone when exposed to compression and shear loading; and second, to propose and test a relatively simple procedure to test samples in this environment.

For this study, both fresh and archaeological sheep bones were acquired and cut into 3 cm long samples. Fresh bone samples were incinerated at temperatures of 300°C, 600°C, and 900°C. To assess the preservation state of the samples, their chemical composition was determined using FTIR spectroscopy. Furthermore, collagen yield was obtained through demineralisation and lyophilisation. The samples were fitted with rosette strain gauges, buried into the soil and subjected to mechanical testing. A direct shear machine was used to subject the samples to both compressive and shear stresses, and the strain gauges recorded the strain in the sample during testing. The obtained data was analysed to determine the extent of damage suffered by the bone samples.

This paper presents information on the strain behaviour of bones in different preservation states subjected to different types of loading. The proposed methodology proved to be relatively simple and fast, as well as adjustable to different types of loading, samples, and soils. This procedure could be used to contribute to the data set needed for further research.

10 GHOST OF LOADINGS PAST. THE CASE OF A ROMAN VICUS UNDER A 19TH CENTURY EMBANKMENT IN VECHTEN,THE NETHERLANDS

Author: DR.IR. NGAN-TILLARD, DOMINIQUE - TU DELFT- Faculty of Civil Engineering and Geosciences (Presenting author)
Co-Author: DR. HUISMAN, HANS - Cultural Heritage Agency of the Netherlands
Keywords: preservation, compression, overconsolidation
Presentation Preference: Oral

The ratification of the Malta convention has meant that construction works are commonly preceded by research to establish whether damage to archaeological remains will occur. If this is likely, development plans are adapted to enable preservation in-situ or the developer funds a rescue-excavation. A factor playing in favour of in-situ preservation is the overconsolidation of archaeological layers. A soil is said to be overconsolidated when it has been exposed during its history to vertical stresses higher than current ones. As a result, it is only when stresses applied by new constructions exceed the pre-consolidation pressure that soil de-structuration and mechanical damage to archaeology may occur. Many processes can generate overconsolidation at archaeological sites. Site burial followed by erosion, construction of structures, then demolished, soil trampling by heavy animals, drainage of topsoil to keep site occupants' feet dry, increase of ground water level after site abandonment, but also chemical reactions and ageing can cause over-consolidation.
High over-consolidation has been measured in the foundation layers of a high embankment (up to 15 m high) built in the 19th century at Vechten, the Netherlands. The embankment was erected on top of a former Roman vicus established on the natural levee. The Roman level and the 19th century topsoil are rich in fragments of ceramics, bones and metal objects. Over-consolidation pressures are in line with the measured strength and stiffness of the foundation material and the massive soil structures analysed using X-ray micro-computed tomography and micro-morphology. The absence of deflection of the interface between the embankment and its foundation layers indicates that the archaeological layers were already in an over-consolidation state before the construction of the embankment and remained over-consolidated after its construction. In such circumstances, it is only by affecting the groundwater flow and chemistry that the embankment could have degraded underlain archaeology.

11 HINDSIGHT AND GUIDANCE; SOME ENGLISH EXAMPLES

Author: Dr Williams, Jim - Historic England (Presenting author)
Keywords: Preservation assessment, guidance
Presentation Preference: Oral

In the 25 years since the Valletta Treaty was signed, we've had five conferences on Preserving Archaeological Remains In Situ, and numerous sessions at past EAA meetings, each containing research taking us much closer to understanding how preservation can be achieved in practice. As our understanding of human and natural threats has increased we've published guidance to help ensure best practice is widely shared and common standards are applied. In England this includes the 'Mitigation of Construction Impact on Archaeological Remains,' 'Piling and Archaeology', and most recently 'Preserving Archaeological Remains.' In this presentation I will review what this guidance tells us about how we have sought to manage and preserve archaeological sites in the past, and highlight the improvements to our knowledge and leadership over the past 25 years.

281 THE ARCHAEOLOGY OF PLEISTOCENE HUNTER-GATHERERS AND THE VALLETTA TREATY: TIME FOR A REWRITE?

Theme: 2. The Valletta Convention: the next 25 years
Author: Raczynski-Henk, Yannick (Netherlands) - Leiden University; ADC ArcheoProjecten Netherlands
Co-Author(s): Paulussen, Rob (Netherlands) - ArcheoPro NetherlandsWilkinson, Keith (United Kingdom) - Winchester University; ARCA Geoarchaeology UKSoressi, Marie (France) - Leiden University
Keywords: hunter-gatherers, archaeological heritage management
Presentation Preference: Short papers and discussion

The first Europeans were mobile hunter-gatherers and peopled Europe from at least 1 million years ago onward. Article 1 of the Valletta Treaty defines archaeological heritage as follows: "...all remains and objects and any other traces of mankind from past epochs." The scant and often enigmatic remains left behind by the highly mobile people of the Pleistocene are often neglected or overlooked in these systems. Also, the fragmentation of the archaeological record along and within national boundaries, makes synthesis of archaeological research on a higher geographical level challenging.
This session aims to bring specialists from different European countries together to discuss how hunter-gatherer archaeology is practiced in various academic and Archaeological Heritage Management (AHM) systems. By offering a forum to confront practices across Europe, we hope to improve international cooperation and coordination, and to refine the implementation of the Valletta Treaty to hunter-gatherers archaeology. The ultimate goal of the session is to publish a paper in which we propose steps and actions to improve and consolidate the position of the archaeological heritage of our nomadic forebears within Archaeological Heritage Management.

Speakers and participants are required to read a number of short papers giving an outline of the organisation of AHM-systems in different countries concerning hunter-gatherer archaeology as necessary basic information to improve discussions. These papers are written for the session by invited contributors. Presentations are divided between invited speakers and an open call for papers.

01 PALAEOLITHIC FRENCH PREVENTIVE ARCHAEOLOGY: A REVIEW

Author: Doctor/Phd Depaepe, Pascal - Inrap; CNRS UMR 7194 (Presenting author)
Co-Author: Dr Goval, Emilie - MCC; CNRS UMR 7194; Dr Locht, Jean-Luc - Inrap; CNRS UMR 8591
Keywords: Paleolithic, France, PreventiveArchaeology
Presentation Preference: Oral

In the French system of preventive archaeology, the development of researches regarding Pleistocene hunters-gatherers has many problems, among others:

- The low rate of researchers dedicated to Pleistocene studies, both on field and into the places of decision (administrative and political ones)
- The deep burial of the Palaeolithic sites, sometimes several meters deep
- The high cost of these excavations
- Regulatory flaws and deficiencies in decision-making by the administration concerning sites not directly affected by public works (due to their depth of burial) but which may remain threatened
- The attraction for an archaeology of the monument, to the detriment of the less visible archaeology of the Palaeolithic sites
- The economic crisis of 2008 and consequently the collapse of the great public works (highways, airports, etc.) which were an ideal place for Palaeolithic archaeology

The situation may seem paradoxical, given the interest of the population in Prehistory.
The aim of this paper is to present the situation of the French preventive archaeology of Palaeolithic times, and to explore solutions.

02 ENGLISH PALAEOLITHIC AND MESOLITHIC ARCHAEOLOGY: A CROSS-CHANNEL VIEW ON PROTECTING AND UNDERSTANDING A COMPLEX RECORD

Author: Dr Pope, Matt - UCL Institute of Archaeology (Presenting author)
Keywords: Palaeolithic, Mesolithic, Development
Presentation Preference: Oral

Following on from a meeting held at the Society of Antiquaries in London in 2016, this paper brings together some current thinking on challenges to undertaking effective management, protection and assessment of Palaeolithic and Mesolithic archaeology in development led projects. Comparing the English experience to that of Northern France we consider how the record is viewed by other heritage professional and the public, and explore barriers to and opportunities for effective assessment and interpretation.

03 THE CRM IMPLICATIONS OF THE 'HOMININ ABSENCE PARADIGM' IN THE BRITISH EARLY LATE PLEISTOCENE: AN ISLE OF WIGHT CASE STUDY

Author: Dr Wilkinson, Keith - University of Winchester (Presenting author)
Keywords: England, Middle Palaeolithic
Presentation Preference: Oral

Britain's position at the north-west extremity of the European continent and the variability of its island status have played important roles in its Pleistocene occupation. For example present data suggest hominins were absent from the British peninsula/island during the period MIS 6-4 (191-60,000 BP), a view that when repeatedly accepted as reality has important implications for the archaeological management of the British Palaeolithic record. Issues surrounding the poverty of the early Late Pleistocene archaeological record in southern England are explored in relation to a supermarket development south of the town of Newport, on the Isle of Wight. Archaeological investigations were initiated on the site because of its proximity to the richest Palaeolithic locale on the Island and the presence on the site of (undated) Pleistocene fluvial strata. The geoarchaeological field and laboratory strategy comprised multiple phases of test pits and boreholes, each planned on the basis of prior results, while a chronology was provided by OSL dating of sand facies in the fluvial gravel. As a result Pleistocene fluvial strata dating to the MIS 5d to MIS 4 interval were mapped in the western part of the site, in a position that would be truncated by a cutting for a new access road. As the deposits were of early Late Pleistocene age they were assessed as having a low archaeological significance and no further

investigation was carried out. Such an assessment – albeit perhaps warranted on the basis of the type of deposits present – is an example of the self-perpetuating power of the paradigm.

04 PLEISTOCENE HERITAGE IN ENGLAND: A POLICY MAKER'S PERSPECTIVE

Author: Dr Fluck, Hannah - Historic England
Co-Author: Dr Last, Jonathan - Historic England (Presenting author); Corcoran, Jane - Historic England
Keywords: Pleistocene, planning, policy,
Presentation Preference: Oral

Britain lies on the fringes of the Palaeolithic world yet preserves the earliest evidence of human occupation in north-west Europe. There is a long tradition of research into 'open-air' sites; historically, for the Lower and Middle Palaeolithic this has been associated with quarries as significant sources of remains from deeply buried deposits, while Upper Palaeolithic remains have been recovered from a wider range of landscape contexts.
Nevertheless, both deeply buried and ploughzone sites present challenges for heritage managers. Much of this archaeology cannot be directly protected by legislation. Responsibility for Quaternary deposits also lies with other organisations (e.g. Natural England) who may have different priorities. Access to quarry faces and exposures can be difficult; fieldwork methods are often geared to the requirements of later periods (discovering finds and features rather than mapping and modelling deposits); local authority Historic Environment Records are frequently incomplete for Palaeolithic evidence; and public awareness of 'deep time' is limited.
Historic England is the public body that looks after England's heritage, advising government and working to support those who care for England's past, whether through ownership, land management or working to mitigate the impacts of development. In this paper we highlight the challenges that the legislative and practical framework for archaeology in England presents for hunter-gatherer archaeology. As a heavily development-led system there are issues around the perceptions and skills of heritage professionals not used to dealing with this type of archaeology. These influence all stages of investigation, from identifying Palaeolithic potential, to the application of excavation methods, and the treatment of finds and samples. Historic England is addressing these challenges through guidance, training and funding, and we will look at how this is influencing the practice of evaluating and mitigating hunter-gatherer archaeology with examples from development-led excavations, emergency recording and research investigations.

05 INTO THE DEEP. PROSPECTING FOR MIDDLE PALAEOLITHIC OPEN AIR SITES IN THE CONTEXT OF ARCHAEOLOGICAL HERITAGE MANAGEMENT.

Author: Drs. Paulussen, Rob - ArcheoPro
Co-Author: Drs. Raczynski-Henk, Yannick - Leiden University (Presenting author)
Keywords: hunter-gatherers, AHM, prospection
Presentation Preference: Oral

In the spring and summer of 2014, the first ever prospection and subsequent excavation campaign specifically targeted at Middle Palaeolithic archaeology was conducted in the trajectory of a proposed road in the loess area of the Southern Netherlands, the so called BPL. At that point CRM-archaeology had been well established in the Netherlands with legal and operational frameworks, but Middle-Palaeolithic archaeology, and by extension, the majority of hunter gatherer archaeology, fell outside the scope of Dutch CRM-archaeology.
This is a direct result of the Werdegang of Dutch archaeology, which came of age through the prospection and investigation of large settlements with a well definded cultural layer and features, dating to the Later Prehistory, Roman Era and Early Middle Ages, like Forum Hadriani and Dorestad. The methodological traditions developed here, in part by Caspar Reuvens, the first ever Professor of Archaeology in the world, resonate heavily in the toolkit designed for use in CRM archaeology.
It was clear from the start of the BPL-project that this standard toolkit was wholly unsuited for the task of locating and investigating lithic scatters in loess sections of up to six metres in depth. A new, specialised approach was developed, tried and tested and resulted in the discovery and subsequent excavation of the Neanderthal site of Amstenrade – Allée.
This paper aims to discuss the process at the base of this discovery and the possibilities and pitfalls concerning its implementation as a new addition to the Dutch CRM-toolkit.

284 ISOTOPIC PROVENANCING IN ARCHAEOLOGY: WHAT DOES LOCAL/NON-LOCAL REALLY MEAN?

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Von Holstein, Isabella (Netherlands) - Vrije Universiteit Amsterdam
Co-Author(s): Pellegrini, Maura (United Kingdom) - University of Oxford
Keywords: Isotopes, baseline, mobility, isoscape, sourcing
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Isotopic analysis is now firmly established in archaeology as a provenancing method for both organic and inorganic materials, including humans, animals and objects. However, compared to isotopic studies in ecology or forensics, work on archaeological samples is complicated by difficulties in establishing isotopic baselines in the past. Such baselines are key reference points for interpreting the results, but the appropriate scales of these background values are yet to be identified. Sourcing studies in archaeology are further complicated by the fact that measured isotopic compositions in archaeological finds may differ from their pristine values as a result of contamination from the burial environment or due to laboratory workup. Further, the ambiguities surrounding the identification of an object or person as "local" or "non-local" need to be fully identified and explored.

This session provides a forum for scientists and archaeologists to discuss the uncertainties associated with isotopic data generation, manipulation and interpretation. Topics for exploration include: What is an appropriate baseline in archaeology? How should baseline samples be selected? How should "local" and "non-local" isotopic results be distinguished statistically? What is the appropriate metadata to incorporate into an online depository to facilitate big data approaches to past isotopic systems? What are the consequences of workup differences between laboratories on the quality of the data in online depositories? How can isoscape models, incorporating both big data approaches and quantitative modelling, be properly tested for past ecosystems?

01 PITFALLS OF ISOTOPIC PROVENANCING IN ARCHAEOLOGY: ESTABLISHING BACKGROUNDS, SAMPLE PREPARATION AND DATA INTERPRETATION

Author: Dr Pellegrini, Maura - University of Oxford (Presenting author)
Keywords: Isotopes, Mobility
Presentation Preference: Oral

Sourcing items and people by means of isotopes has become a popular research activity in archaeology. The widespread and availability of instrumental facilities, as well as the improvement of their sensitivity and measurement capacity, has contributed to dramatically increasing the number of databases in the field. The increment of data produced has however also been associated to sometimes naive interpretation of these measurements. There are a number of problems that can affect the measured isotopic datum, which may be totally independent on the pristine biological signal. Sometimes, these issues are ignored or played down by inexperienced scientists. Among these issues, there are post-mortem/diagenetic alterations, modifications after manipulation of the specimens during sample preparation, specific data calibration to convert the raw data to comparable datasets.
For humans, besides, a series of physiological and locally-based phenomena can determine specific isotopic values that can be different from the expected values. For example, in the case of oxygen isotopes, food and drink preparation habits have been proposed to be responsible for an increase in the recorded 180/160 compared to the attended drinking water values, which are often blindly obtained from available general distribution of isotopes in precipitations or groundwater values. Also, long or short-term climate shifts, which may be recorded in the tooth of one individual but not in the general patterns of current precipitations, or people drinking from sources other than precipitations (e.g. offsprings of lakes), could contribute to interpret one individual as non-local to an area in which he/she indeed spend all his/her life.
In a similar way, strontium isotope ratios measurements in tooth enamel are affected by pitfalls related to non-straightforward routing of strontium isotopes from geology to biosphere. In this paper, we will address all the above issues, and suggest possible ways thorough.

02 BACK TO BASICS: A CYPRUS CASE STUDY PROBLEMATIZING SAMPLING FOR A STRONTIUM ISOTOPE BASELINE

Author: Scientific Assistant Ladegaard-Pedersen, Pernille - National Museum of Denmark - Environmental Archaeology and Material Science (Presenting author)
Co-Author: Prof Frei, Karin Margarita - National Museum of Denmark - Environmental Archaeology and Material Science; Prof Kristiansen, Kristian - University of Gothenborg - Department of Historical Studies
Keywords: Strontium baseline sampling
Presentation Preference: Oral

As part of the "Towards a New European Prehistory" research project, we have scheduled a sampling campaign on the island of Cyprus in June 2017 with the express intent of creating a baseline for strontium isotopes. The project, funded by Riksbankens Jubileumsfond, Sweden, focusses on big transformations (migrations/trade/technology) by means of a multidisciplinary approach involving archaeology, aDNA, strontium isotopic tracing and language change.
In this talk, we discuss sampling for a strontium baseline from an environmental angle (geology, hydrology and sediment). In this respect, Cyprus offers a unique example. As an island, Cyprus has both a restricted landmass surrounded by seawater and contrasting geological formations (and the accordant diversity in the concentration of strontium therein). It was also a nodal point in prehistory in relation to mobility.
We know that strontium moves from the environment into the human skeleton through pathways of bioaccumulation, determined by a combination of environmental factors (bioavailability of strontium in water and soil and subsequent uptake in biota and humans) and diet (source of drinking water and diet of ancient peoples). Due to the arid climate, the prehistoric inhabitants of Cyprus were obligated to rely on ground- rather than surface water for the summer. Against this background this paper explores the importance of sampling groundwater from those aquifers relevant to prehistoric settlements in addition to groundwater and surface water from all geological formations within a specific region of study, rather than from just from the vicinity of known archaeological sites. We use a multi-sample technique (including soil and plant samples) in order to explore which biosphere samples are the best proxies for the bioavailability of strontium and, through this, the pathways of bioaccumulation.

03 BIOAVAILABLE STRONTIUM ISOTOPES: HOW SHOULD THEY BE MEASURED?

Author: Dr. Copeland, Sandi - Los Alamos National Laboratory (Presenting author)
Keywords: bioavailable strontium isotopes
Presentation Preference: Oral

In order to identify local versus non-local fossils, archaeological specimens, and modern animals using strontium isotope analyses (87Sr/86Sr), it is essential to understand the distribution of bioavailable strontium isotopes across the region. Researchers have used a variety of methods to determine bioavailable strontium distribution, ranging from empirical documentation of environmental samples across the region to high tech computer modeling. I will present the results of my attempts to analyze bioavailable strontium using predominantly empirical studies of several different materials at locations in South Africa. I have comparative data from modern plants, animals, snails, insects, soils, rocks, and water from a variety of geological settings and habitats. In some but not all cases, plants differed from snails, and whole rock differed from water-leached soils which in turn differed from acid-leached soils. In the Sterkfontein Valley, bedrock geology appears to assert the predominant control over bioavailable strontium, whereas on the south coast of South Africa, marine-derived strontium appears to be the predominant factor. Methodological considerations such as the area that needs to be sampled, density of sampling locations, and materials to be sampled will be discussed in light of these findings.

04 LOCALS AND NON-LOCALS. PLANTS, ANIMALS, PEOPLE IN IRON AGE CENTRAL ITALY

Author: Dr. Motta, Laura - University of Michigan (Presenting author)
Co-Author: Dr Gleason, James - University of Michigan; Dr Cangemi, Ivan - University of Michigan
Keywords: Sr, baseline, Italy
Presentation Preference: Oral

Sr isotope analyses have been performed on 92 inhumations, 28 faunal samples and 22 botanical samples from four Iron Age/ Archaic sites in Central Tyrrhenian Italy, located on very distinctive volcanic geology. The results are used to assess isoscapes modeled on geological variability. In addition, we discuss the common practice in archaeology to use faunal remains to determine biologically available Sr and local ratios. We suggest that a combination of pedological samples, modern grasses, ancient cereals and leach water can be used to create a more accurate baseline for future research.

05 ISOTOPE MAPPING AROUND THE LATE IRON AGE SITE OF BASEL-GASFABRIK, SWITZERLAND: DETERMINING LOCAL RANGES IN GEOLOGICALLY COMPLEX ENVIRONMENTS

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Keywords: Strontium, Oxygen, Land-use
Presentation Preference: Oral

Basel-Gasfabrik (Switzerland) is an extensive La Tène (ca. 150 – 80 BC) settlement with domestic and economic structures and two associated cemeteries. Strontium (87Sr/86Sr) and oxygen (δ18O) isotope analyses of human and faunal teeth investigated regional and supra-regional contacts indicated in the archaeological and archaeobiological record. The interpretation of the analytic data, however, requires information on the isotopic values near the site. Using 102 modern vegetation and 9 water samples from 51 locations the presented study characterizes the isotopic composition of the biologically available strontium and oxygen of the prevailing geological units and water courses in the surrounding of Basel and compares these to 23 archaeological human deciduous teeth, 6 pig teeth and 5 dog teeth from the site. Furthermore, pedological criteria evaluate the suitability of different landforms and geological units for agriculture and pasture. The 87Sr/86Sr ratios of the environmental samples from sedimentary, volcanic, and metamorphic geological units in up to 50 km distance ranged widely between 0.70830 and 0.71240, while δ18O values of river water varied between -11.05 and -6.31 ‰ (V-SMOW) respectively. In contrast, Sr isotope ratios of human deciduous teeth were much more homogeneous (0.70847 – 0.70921) and coincide largely with values determined for potential arable soils around Basel. They indicate targeted exploitation or avoidance of landscapes for agriculture. The 87Sr/86Sr ratios of the faunal teeth were more variable and point to widely ranging habitats or imports from the hinterland of the site. The study documents the complexity of distinguishing local and non-local individuals in a geologically complex region and the potential of isotope data to explore prehistoric land-use patterns. Combining isotopic data of archaeological teeth with modern vegetation and water samples is a promising way to characterize isotopic characteristics of a site's surrounding, but requires evaluation of each sampling locality concerning geomorphological and pedological preconditions.

06 EXPLORING MARINE EFFECTS ON BIOMINERAL STRONTIUM ISOTOPE VALUES: SEA SPRAY, SEA SALT AND SEAFOOD

Author: Dr. Laffoon, Jason - Leiden University; Vrije Universiteit Amsterdam (Presenting author)
Keywords: mobility, isotopes, marine
Presentation Preference: Oral

Strontium (Sr) isotope analysis of human skeletal remains is a frequently utilized tool in studies of past human migrations and provenance. These studies generally rely on the assumption that mineral weathering of underlying bedrock geology is the primary or sole source of Sr in biominerals. The interpretation of human biomineral 87Sr/86Sr data, and the distinction between local and non-local individuals, is most often made via comparison with 'baseline' Sr isotope data. The most common method for establishing local baseline 87Sr/86Sr ranges is the bioavailable method which aims to independently asses the range of local isotope variation via 87Sr/86Sr data from presumably local faunal and floral samples. Persistent questions remain, however, concerning the extent to which non-geological or non-terrestrial Sr sources influence biogenic Sr isotope ratios. Possible mechanisms whereby marine Sr could influence the bioavailable 87Sr/86Sr of terrestrial ecosystems include deposition of sea spray or marine-derived precipitation onto terrestrial ecosystems and subsequent uptake by plants via soil exchange, and direct consumption of marine resources by humans and animals. The potentially complicating effects of marine Sr are of particular concern in island and coastal settings and where independent evidence indicates substantial consumption of seafood. The possible influences of marine Sr on biomineral 87Sr/86Sr have been often noted in the relevant literature but have yet to be thoroughly investigated. In this paper I explore the potential contributions of marine Sr to human 87Sr/86Sr values from both theoretical and empirical grounds, and discuss the implications of these for interpretations of human Sr isotope data in mobility and provenance studies.

07 TRAVELLING ACROSS THE ATACAMA DESERT: NEW EVIDENCE FOR HUMAN MOBILITY IN NORTHERN CHILE BASED ON OXYGEN AND STRONTIUM ISOTOPES

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Keywords: Mobility, non-local, Atacama
Presentation Preference: Oral

The study of human mobility is essential for understanding the social and cultural dynamics of the pre-Columbian groups that inhabited the Atacama Desert. Material culture suggests that during the Late Intermediate Period (LIP; AD 900-1450) individuals crossed the desert from the coast to the Andes and vice versa. Fish and shellfish remains, have been found in the interior valleys, while textiles and inland crops are found at the coast. Several models presented to explain the high levels of human mobility in the Atacama all focus primarily on economic motivations. Yet, to date, very little information is available regarding who the travellers themselves were (sex, age, and cultural adscription), limiting our understanding of the identity of the travellers. This paper explores LIP mobility patterns in northern Chile through the application of strontium and oxygen isotope analyses on ancient human teeth recovered from several archaeological sites. First we present a small local bioavailable strontium baseline for the study area, based on plant and animal remains, which helps to alleviate the scarcity of bio-available strontium isotope data for northern Chile. Results show non-local individuals of both sexes were buried in the dispersed cemeteries of Pica 8, Quitor 6 Tardío and Los Verdes 1. Most of the outlier individuals reported for Pica 8 are also shown by oxygen isotope values, while for Quitor 6 Tardío and Los Verdes 1 the outliers are evidenced in 87Sr/86Sr isotopes alone. These results support the idea that varied groups of individuals moved across the landscape, complementing and augmenting the larger discussion about pre-Columbian mobility patterns in the Atacama Desert.

08 IMPACT OF PROVENANCE ON PALAEODIETARY INTERPRETATIONS OF SULPHUR STABLE ISOTOPE VALUES IN THE IRON GATES GORGE AND THE DANUBE DELTA

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Keywords: palaeodiet, sulphur, Danube
Presentation Preference: Oral

Sulphur in human bone collagen is derived from dietary protein and directly reflects geological sulphur values. Stable sulphur isotope ratios (δ34S) have therefore been used to investigate both residential mobility and dietary intake in past populations.

It has been argued that δ34S values may, in certain contexts, provide a more reliable measure of aquatic resource consumption than the more conventional co-analysis of carbon (δ13C) and nitrogen (δ15N) stable isotope ratios. For example, Nehlich et al. controversially proposed that δ34S values were better markers for freshwater fish in diet at the Mesolithic-Early Neolithic transition sites along the Iron Gates Gorge stretch of the Danube owing to the (arguable) similarity of 113C and 115N values of freshwater and terrestrial resources.

However, palaeodietary reconstruction based on δ34S values is non-trivial, particularly in groups with residential mobility or non-local provenance, of all or part, of the population. Place of "origin" has significant implications for the interpretation of δ34S values. Individuals who remain in one place for the whole of their lives should have δ34S values that reflect those of local dietary resources. However, in individuals who have moved from their place of origin δ34S values potentially reflect the 'mixed' signals of heterogeneous geologies: in such cases the δ34S values of local food sources may not provide appropriate baselines for evaluating diet.

Understanding the usefulness of δ34S as a dietary discriminant in humans can be advanced by determining the provenance of the individuals analysed. Strontium stable isotope analysis, a recognized and widely used method for establishing non-local origin, is a crucial pre-requisite step in human palaeodietary reconstruction based on δ13C, δ15N and δ34S values. Additional studies of δ34S values of animal remains, which have been identified to species level, are essential for resolving incongruities between δ15N and δ34S datasets.

09 A JOURNEY TO THE SOUTH. TRACING HUMAN MOBILITY IN THE EARLY BRONZE AGE OF EAST-CENTRAL EUROPE

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Keywords: isotopes, mobility, Bronze-Age
Presentation Preference: Oral

In the early 2nd millennium BC (roughly 1850-1800 cal. BC) human populations occupying the lowlands of today's central Poland started their gradual expansion to the south. A hundred years later they reached the highlands of Lesser Poland and moved further east to Podolia and Volhynia. Their appearance is clearly visible is sudden changes of material culture and burial customs in colonised regions. To find out which social groups were on the move we applied a range of research tools, including physical anthropology, genetics, statistics, and isotopic geochemistry. The latter included measurements of strontium and oxygen isotope ratios in human teeth enamel. We used these methods, based on differences in geology and climate between places of origins and departure, for detecting the skeletal remains of first newcomers. The results of pilot studies proved that local ranges of bioavailable 87Sr/86Sr and δ18O in our areas of interest are significantly different. Moreover, the carbon (δ13C) and nitrogen (δ15N) isotope signatures available for pre-Bronze Age populations from Poland indicate local variability of consumed foodstuffs caused by e.g. abundance of freshwater fish or favourable conditions for millet growth. Hence, δ13C and δ15N values in human bone collagen were measured to acquire additional data on humans' geographic origins. The mobility of the deceased was compared with their sex and age, form of burial, and type of offerings.
In this paper the ways of calculating 87Sr/86Sr ranges in postglacial landscapes will be discussed. Special attention will be paid to the problem of modern contamination of human and animal samples. Last but not least, we will address questions regarding data processing and interpretation.
Funding: National Science Centre (Poland), grant OPUS no. 2015/17/B/HS3/00114, project "Migration and kinship in East-Central Europe in the first half of the 2nd Millennium BC".

10 HOW FAR THESE CATTLE DID COME FROM? CATTLE TRADE IN IRON AGE AND ROMAN LANGUEDOC (FRANCE) FROM STRONTIUM ISOTOPIC RATIOS

Author: Dr Valenzuela-Lamas, Silvia - Consejo Superior de Investigaciones Científicas (Presenting author)
Co-Author: Dr Nieto-Espinet, Ariadna - Université de Montpellier; Prof. Bosch, Delphine - Université de Montpellier; Dr. Gardeisen, Armelle - Université de Montpellier
Keywords: Mobility, zooarchaeology, isotopes
Presentation Preference: Oral

Previous isotopic studies have shown that not only amphorae and other ceramics but also living animals were traded over long-distances in Roman times (e.g. Minniti et al. 2014). This paper presents the results obtained on 20 cattle teeth from Iron Age and Roman Lattara and La Monedière (Languedoc, Southern France). The results suggest that there was a bigger mobility of animals in Roman times, although some cattle were sourced from about 40 Km inland during the Mid Iron Age (4th c. BC) at La Monedière.
The isotopic results are combined with zooarchaeological data from this area, as they suggest that the degree of connectivity shaped animal husbandry in the two sites analysed. The results also open the perspective of creating isoscapes of meat provisioning and assess changes through time.

Minniti, C., Valenzuela-Lamas, S., Evans, J., & Albarella, U. (2014). Widening the market. Strontium isotope analysis on cattle teeth from Owslebury (Hampshire, UK) highlights changes in livestock supply between the Iron Age and the Roman period. Journal of Archaeological Science, 42, 305-314.

11 WHERE DO WE GO FROM HERE? REFLECTIONS ON THE USE OF PROVENANCE ISOTOPES FOR IRON AGE ÖLAND, BALTIC SEA

Author: PhD Wilhelmson, Helene - Sydsvensk arkeologi AB (Presenting author)
Keywords: interpretation, baseline, population
Presentation Preference: Oral

Provenance isotope analysis can be used to investigate a multitude of aspects of prehistoric migration and mobility, but as values they inevitably are interpreted in order to be significant to certain archaeological queries. I have published two papers (Wilhelmson & Ahlström 2015; Wilhelmson & Price, 2017) using some of the exact same provenance isotope values in both, in Journal of Archaeological Science (JAS) and its sister-journal JAS :Reports in the past 2 years. In these papers different research questions were outlined, definitions of local and non-local are different. One major difference is also that the first paper used a single isotope approach, just dealing with 86Sr/87Sr and the second a bi-isotopic, 86Sr/87Sr and δ18O). Moreover, I added a, as far as I can tell, new category of ranges for undefined (gray, undetermined) values in the later paper. This resulted in individuals that cannot be determined with confidence to be either local or nonlocal, being treated as a group of their own, in this case study (Iron Age Öland).

The background, specifics, rationale and comparison of these very different, more and less traditional approaches to isotope variation in the case of Öland, is presented here along with a critical reflection of the interpretational aspect of provenance isotopes. The data size issue is debated as well as the discussion on the interpretational level of isotope values in archaeology.

12 SPATIAL APPROACHES TO ASSIGNMENT

Author: Pouncett, John - University of Oxford (Presenting author)
Keywords: Isotopes, GIS, Bioarchaeology
Presentation Preference: Oral

Bioarchaeology is currently undergoing a spatial turn, with spatial analysis increasingly being used to extend existing approaches to the study of past human mobility. Stable isotopes are routinely used to identify individuals who are 'local' or 'non-local' to the locations they were found in, however the definition of 'local' and 'non-local' has proved to be problematic. 'Isoscapes' have emerged as a possible solution to this problem, with geostatistical methods used to construct models of the spatial variation in the expected values of stable isotopes against which the isotopic compositions of individuals can be compared. This paper sets out best practice for spatial modelling of stable isotopes and determining whether an individual is consistent with the location that they were found.

13 PROVENANCE STUDIES ON METAL ARTEFACTS OF THE EARLY DANISH BRONZE AGE: COMPARING LEAD ISOTOPE DATA WITH THE ARCHAEOLOGICAL EVIDENCE

Author: Dr. Noergaard, Heide - Aarhus University, School of Culture and Society (Presenting author)
Keywords: NBA, networks, knowledge-exchange
Presentation Preference: Oral

As early as 2100 BCE, societies in the hotspot zone of Denmark and Scania began to use metal. However, 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. However, little is known about the significance, the extent and the direction of this metal trade. 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. In regard to the late Neolithic, only the archaeological evidence was used to identify contact networks pointing towards northwest and southeast Europe.
However, the data available to define the bigger picture of this cross-European networks and the obvious shift within it, is, from an archaeometallurgical as well as archaeological perspective, neither covering the hole time span nor providing the needed amount of analyses to make concrete statements. As such, an extensive study of south Scandinavian metal artefacts between 2100-1600 BC aims via lead and tin-isotope analyses to uncover metal transport routes and trading networks and their significance for the earliest NBA societies in the North. Furthermore, these 600 new scientific analyses, covering the timespan of 500years, will directly be correlated with the archaeological evidence in order to support both trace-element and LIA as well as to circumvent the problems with the isotope allocation to ore deposits.

14 ND ISOTOPES: PROBLEM SOLVER OR CREATOR?

Author: Prof. Dr. Davies, Gareth - Vrije Universiteit Amsterdam
Co-Author: Plomp, Esther - Vrije Universiteit Amsterdam (Presenting author); Dr. Von Holstein, Isabella - Vrije Universiteit Amsterdam; Dr. Font, Laura - Elsevier; Dr. Koornneef, Janne - Vrije Universiteit Amsterdam
Keywords: Isotopes, human provenance
Presentation Preference: Oral

Isotopic analysis has become an established provenance method in archaeology but several limitations remain unsolved. The addition of a new isotope system in the quest for more precise human provenancing can potentially provide us with more specific information on the region of origin, particularly when used in combination with more established systems (such as strontium (Sr) and oxygen (O)). This study reports on the viability of using neodymium isotopes (143Nd/144Nd) as a candidate to study the origins of humans. Neodymium isotopes have recently been applied to identify the production centres of glass archaeological artefacts. While the concentration of Nd of glass artefacts is substantial enough for conventional analyses, this is not the case for human tissues. The human body has a tendency to filter out non-essential elements, which means that Nd concentrations are very low in human teeth (Nd <0.1 ppm), such that previously Nd isotope analysis was not possible. This study presents the neodymium concentration and composition results of third molars from modern Dutch residents. Sub-nanogram amounts of neodymium were analysed using a thermal ionization mass spectrometer (TRITON-Plus) equipped with 1013 Ω resistors at the Vrije Universiteit Amsterdam. The Nd results will be compared to other isotopic systems (Sr) and the possibilities for Nd as an archaeological human provenancing technique will be discussed.

15 OXYGEN ISOTOPIC COMPOSITION OF BONE COLLAGEN: AN ADDITIONAL PROXY FOR RESIDENTIAL LOCATION?

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Keywords: Collagen, oxygen, workup
Presentation Preference: Oral

Archaeological and forensic studies of human mobility regularly analyse oxygen isotope ratios in tooth enamel carbonate or phosphate to indicate juvenile residential location. This approach has also occasionally been applied to bone bioapatite, to acquire similar information about adulthood. The various methods of preparatory laboratory workup for bioapatite carbonate (the most widely used substrate) have however been shown to alter the original oxygen isotopic composition of the tissue. Collagen proteins represent an independent source of O in bone. Oxygen isotopic ratios in collagen are likely to reflect a different fraction of diet/drinking water to that recorded in bioapatite, and may therefore complement values obtained from the mineral fraction of the tissue.
Collagen workup for isotopic analysis is well established. Most frequently this consists of demineralisation and (optional) gelatinisation in acidic aqueous solution, followed by freeze drying. However, it is known that proteins can exchange O from carboxylic acid residues with solvent water at low pH. Extracted collagen oxygen isotopic composition may therefore include contributions to O from workup reagents, solvents and atmospheric water.
This presentation explores the results of an experiment on three bone collagen materials with a range of oxygen isotope ratios to examine these effects. This compared workup methodology (EDTA/HCl) and drying methodologies (freeze/oven drying). The results showed that reagent identity, methodology, solvent oxygen isotopic composition and drying method all affect O exchange in collagens, which show variable oxygen isotopic composition even under optimum conditions. This presentation discusses the implications of these results for archaeological and forensic applications.

285 APPROACHES TO EARLY FARMING SYSTEMS: DIFFUSION AND DEVELOPMENT OF AGRICULTURAL PRACTICES INTO THE MEDITERRANEAN

Theme: 5. Comparing Archaeology Across Regions and Periods
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Keywords: Farming, Agriculture, Neolithic, Mediterranean, Interdisciplinarity,
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The emergence of agricultural economies is a defining factor in Neolithic societies not only because a relevant part of subsistence depended on domesticated plants, but also because crop-husbandry practices strongly affected the life-style of farming groups in many different aspects.. Therefore, it is not a surprise that the study of farming systems can be addressed from a variety of angles using different approaches, eg. by directly analysing seeds and fruits or, indirectly, by assessing its impact on the environment and the subsequent landscape modifications. It is also possible to explore the influence of crop-husbandry practices in the technological system; new knowledge and novel tools were developed while existing technologies were adapted to new tasks.
In this session, we aim at bringing together scientists working on different issues related to Neolithic farming systems of the Mediterranean: crop and weed assemblages, agricultural tools and techniques, field manuring, animal feeding practices, storage techniques, by-product uses, dietary patterns, social aspects of agricultural production and its environmental impact, etc. Our objective is to approach agriculture as a non-divisible system, in which domesticated plants and animals, environment, human techniques and cultural practices continuously and reciprocally interact. To that end, we invite contributions focusing on the origins, diffusion and development of agricultural systems from an array of viewpoints, trying to integrate discipline-specific knowledge into an interdisciplinary framework. Comparative studies about interregional dynamics between different areas of the Mediterranean are welcome as well.

01 CLOSE TO HOME: EARLY NEOLITHIC CROP CULTIVATION IN THE LOWER GALILEE, NORTHERN ISRAEL

Author: Mrs. Birkenfeld, Michal - Israel Antiquities Authority (Presenting author)
Keywords: Neolithic, Cultivation, GIS
Presentation Preference: Oral

The Pre-Pottery Neolithic B (PPNB) of the southern Levant (ca. 8,500-6,400 calBC) was a period of fundamental changes in human economic strategies, largely associated with the advent and intensification of an agro-pastoralist economy. Within this general trend, however, significant variability and a plethora of subsistence (and subsequent settlement) patterning can be distinguished between the different sub-regions.
Located in northern Israel, the Lower Galilee is a well-defined geographical unit, rich in resources, fertile soils and plentiful fresh water. These favourable conditions were probably responsible for attracting Early Neolithic populations to the region. Their subsistence was based mainly on the cultivation of domesticated crops, mainly lentils (Lens culinaris) and horse beans (Vicia faba), while hunting continued to play a vital role.
A detailed analysis of PPNB dynamics in the region examined issues of social and economical organization, interaction and change, and enabled a discussion of how subsistence-related activities were spatially organized around the habitation site.
Results suggest a division of the landscape into several exploitation spheres, dedicated to different but inter-connecting tasks. The different traits of the exploitation spheres (proximity to the habitation, differential composition and resource distribution, etc.) have implications as to the type of tasks and activities performed in them. This assists in their interpretation, but also allows a deeper understanding of PPNB agricultural practices. Several crop husbandry models have been previously suggested relating Early Neolithic agriculture (including both intensive and extensive husbandry regimes). The results of the presented study imply that in the Lower Galilee intensive garden cultivation was applied, influencing significantly the social and settlemential organization in the region.

02 INTEGRATED APPROACHES TO EXPLORING EARLY FARMING ACTIVITIES: THE MICROARCHAEOLOGY OF LIVESTOCK DUNG

Author: Dr Portillo, Marta - Marie Sklodowska-Curie Fellow; Department of Archaeology, University of Reading (Presenting author)
Co-Author: Dr Matthews, Wendy - Department of Archaeology, University of Reading; Dr Bull, Ian - School of Chemistry, University of Bristol
Keywords: farming, microarchaeology, dung,
Presentation Preference: Oral

Livestock dung is a key interdisciplinary area of research as it provides valuable information on environmental and ecological issues and socio-economic and cultural aspects of human life. The study of dung provides a direct line of evidence for the investigation of: animal management and feeding practices, domestication and early sedentism, secondary product use (i.e manuring, fuel, tempering), cultural and social aspects of farming production, and its environmental impact. However, this ubiquitous material in many settlements, especially after the domestication of herds, is regularly overlooked in most archaeological research programs. This oversight is commonly due to problems in identifying dung during excavation and in routine sampling procedures in which dung and its contents are frequently disaggregated, lost or mixed with other remains of different origin. As a result, the potential of this data-set has not been fully realized in the archaeological literature and particularly in syntheses on the emergence, diffusion and developments of early agricultural systems.
To illustrate the contribution of integrated microarchaeological approaches (phytoliths, dung spherulites, micromorphology, GC-MS) and comparative modern geo-ethnoarchaeological data to our understanding of the major transformation to early farming, a selection of case-studies are presented here from the Near East, one of the key heartlands in which plants and animals that were domesticated occur naturally, and from northern Africa, a potentially critical area with implications for surrounding regions including the Mediterranean and the Sahara. These integrated approaches demonstrate the potential contribution of new systematic interdisciplinary studies in providing robust data for detection and interpretation of livestock dung, and its value for tracing the developments of farming systems more widely.

03 THE SPREAD OF THE AGRICULTURE AND LIVESTOCK PRACTICES IN THE CENTRAL AND WESTERN MEDITERRANEAN: A GEOSTATISTICAL APPROACH.

Author: Pardo-Gordó, Salvador - Departament de Prehistòria, Arquelogia i Història Antiga. Universitat de València (Presenting author)
Co-Author: Diez Castillo, Agustin A. - Departament de Prehistòria, Arqueologia i Història Antiga. Universitat de València; García-Puchol, Oreto - Departament de Prehistòria, Arqueologia i Història Antiga. Universitat de València; Bernabeu Auban, Joan - Departament de Prehistòria, Arqueologia i Història Antiga. Universitat de València
Keywords: Geostatistics, Dispersal, Radiocarbon
Presentation Preference: Oral

The dispersal of agriculture and livestock from Near East to Iberian Peninsula has been object of intense debate in the archaeological literature, focussing on mechanism of diffusion and adoption of new economical practices. In this context methods like mathematical approaches, agent-based models and statistical approaches among others have been applied.
In this talk our aim is analysing the first evidence of domesticated features (plants and animals) in the Central and Western Mediterranean using geostatistical approach to address the following questions:
a) Do radiocarbon dates made on cereals show the same Neolithic dispersal pattern that radiometric dates made on domesticated animals?
b) Can we identify more than one dispersal route during the dispersal of the Neolithic from the Dalmatia shore to Italian peninsula?
In short, to address these questions we use several statistical measures to know if it is possible to identify several dispersal patterns and several diffusion pathways.

04 WHICH GRINDING TECHNICS IN THE EARLY NEOLITHIC OF EUROPE (VITH-VTH MILL. BC): VARIABILITY, QUESTIONS & PERSPECTIVES.

Author: Dr. Hamon, Caroline - CNRS (Presenting author)
Keywords: grinding, neolithic, Europe
Presentation Preference: Oral

The technological and functional study of grinding tools from different early Neolithic contexts in Europe offers now the possibility to compare the technics and tools used for cereal preparation from continental Europe (Lbk), the Mediterranean area (Impressa-Cardial) and the Balkans (Karanovo type). This presentation will open and discuss questions regarding the variability of the grinding systems between the VIth and the beginning of the Vth millennium BC throughout Europe. How do they inform us on the way cereals were prepared and consumed in these different areas? Do they reflect technical habits, interpretable in a more cultural way? Focusing on the Mediterranean area, the variability of the grinding systems will also be discussed in relation with the type of sites, the duration and the function of occupations. Finally we will replace the question of the grinding technics and cereal processing in the broader scope of the evolution of agricultural practices among early farming populations.

05 FOODPLANTS OF THE FIRST BALKAN FARMERS: ASSESSING THE DIVERSITY OF DOMESTIC AND WILD PLANTS THROUGH MICROFOSSILS ANALYSES ON GRINDING TOOLS

Author: Dr Chevalier, Alexandre - Royal Belgian Institute of Natural Sciences (Presenting author)
Co-Author: PD Dr. Ivanova, Maria - Universität Heidelberg; Prof. Dr. Bánnfy, Eszter - Römisch-Germanische Kommission des Deutschen Archäologischen Instituts; Dr Vukovic, Jasna - University of Belgrade
Keywords: Neolithization, stone_tools, microfossils
Presentation Preference: Oral

Grinding tools such as mortars and hand-mills represent a recurrent element in the artefact assemblages from the earliest farming sites in southeast Europe. Numerous ethnoarchaeological studies describe plant preparation by pounding and grinding as the most labour-intensive and time-consuming domestic task in households dependent on non-mechanised processing. Plant microfossils preserved on prehistoric stone tools are therefore a highly promising (and largely under-explored) source of information on the plant food species exploited by the earliest farmers.
In this communication, we will present the results of phytolith and starch analyses carried on grinding and ponding stone tools from four of the earliest farming sites in southeast Europe (Ecsegfalva and Alsonyék in Hungary, Blagotin in Serbia, and Yabalkovo in Bulgaria) demonstrating their use for the processing of a range of cultivars and other edible plants, and adding valuable information on the already existing plant macroremain record to understand better the neolithization process in Europe.

06 EARLY AGRICULTURAL TOOLKIT IN THE BALKANS: BULGARIAN CASE STUDY

Author: Dr Gurova, Maria - National Institute of Archaeology with Museum (Presenting author)
Keywords: Early Neolithic, sickles
Presentation Preference: Oral

The Early Neolithic evidence from Bulgaria reveals a fully developed crop diversity that provides connections with the Near East crop assemblage and represents an inherent part of the Neolithic package, fully apparent in the earliest Neolithic settlements in Bulgaria. Another unambiguous feature of the very early agriculture is reflected in numerous series of sickle inserts (most with typical cereal polish in diagonal) and a number of preserved sickle handles made from red deer antler (with the 'Karanovo type' of sickle as the best-known example). The sickle blades are an inherent part of a particular Early Neolithic formal toolkit which is made of 'Balkan flint' and represents a supra-regional diagnostic feature of the EN complex in SE Europe. The abundant evidence of a well-developed agricultural system provokes various approaches among which use-wear analysis of the sickle blades/inserts represents one of the most reliable and instructive.
This paper focuses on a new dataset drawn from a study by the author of agricultural toolkits from Bulgaria, Serbia and Turkey, and highlights several challenging points: the emergence of the 'Karanovo type' of sickle (in the context of cultural influx from Anatolia); crop-harvesting technology in diachronic perspective; diffusion of sickles comprising a curved handle and obliquely inserted flint elements from the Balkans into the LBK complex in Central Europe, and comparison with the evidence from the Western Mediterranean.

07 THE HARVEST OF OUR FATHERS: HARVESTING TECHNIQUES AND FARMING PRACTICES IN THE MEDITERRANEAN NEOLITHIC

Author: PhD Mazzucco, Niccolò - UMR 7055 - Maison Archéologie & Ethnologie, René-Ginouvès (Presenting author)
Co-Author: PhD Gibaja Bao, Juan Francisco - IMF-CSIC - Institución Milá y Fontanals, Consejo Superior de Investigaciones Científicas; PhD Ibáñez, Juan José - IMF-CSIC - Institución Milá y Fontanals, Consejo Superior de Investigaciones Científicas
Keywords: Harvesting, Neolithic, Mediterranean,
Presentation Preference: Oral

Neolithic farming practices have been mainly addressed from the analysis of the archaeozoological and archaeobotanical records. These studies have highlighted variability in the type of cultivated plants and domesticated animals since the early phases of Neolithic; as result, different agricultural and pastoral systems have been suggested for the Mediterranean area. However, the technical aspects associated with these practices have been little investigated until now. How technologies and know-how were adapted to farming needs? Did a variability of techniques exist since the beginnings of Neolithic? How tools evolved through time and what information can be drawn about farming practices? In this presentation we will provide some examples of how harvesting technologies evolved during the course of Early and Middle Neolithic in the Central Mediterranean. Changes in crop-reaping tools will be discussed considering the technological aspects of lithic production and the available archaeobotanical and archaeozoological data.

08 AGRICULTURAL SYSTEMS AND STORAGE AMONG NEOLITHIC COMMUNITIES IN THE IBERIAN PENINSULA

Author: Dr Pérez-Jordà, Guillem - CSIC
Co-Author: Dr Peña-Chocarro, Leonor - CSIC (Presenting author)
Keywords: Iberia, neolithic, agriculture
Presentation Preference: Oral

Research carried out over the past years in areas of the Iberian Peninsula has allowed characterizing the agricultural development of the first farming communities and identifying different agricultural traditions. These seem related not only to specific environmental conditions of some of the areas investigated but also to the cultural traditions of the communities that settled in the different territories. Thus, there are regions where agriculture is based on free-threshing wheat cultivation while others where hulled wheats had an important role. There are also areas where the presence or absence of specific crops such as flax or poppy support the existence of particular traditions.
Moreover, there are also differences in the storage behavior of the first agricultural groups with communities that began to excavate storage pits for keeping their harvest and others that kept cereals in ceramic recipients and, most probably, other types of containers made of perishable material.
In this paper, we aim at putting these two variables together, the cultural traditions of each territory and their storage modes, and exploring possible relationships between both. Particular emphases will be given to the eastern part of the Iberian Peninsula and areas of inner Iberia.

09 RECONSTRUCTING THE LANDSCAPE IN CENTRAL COASTAL ETRURIA: DEFINING AGRO-SYLVO-PASTORAL PRACTICES THROUGH POLLEN ANALYSIS AND ARCHAEOLOGICAL RECORD

Author: Post-doc vanni, edoardo - University of siena (Presenting author)
Keywords: Ecology-LAndscape-Pollen analysis
Presentation Preference: Oral

From the perspective of historical ecology, landscape is understood as the historical result of complex interactions between humans and nature. Archaeobotanical research helps understanding the cultural transformations of lands affected by human presence going back to pre-historical and historical periods. Plant exploitation and land use are especially evident from visible and invisible plant remains brought to light from archaeological sites.
Palinological studies conducted in the Accesa Lake, provides a record of vegetation and climatic change spanning over 15,000 years. The impact of Late Bronze and Etruscan settlements near the lakeshore is visible in the increasing values of arable crops, species of secondary forest canopy (Ericaceae) and anthropogenic indicators – especially, Plantago lanceolata, Rumex. Coprophilous fungi such as Sporormiella that were found in two sites in the inland of Cinigiano are also strongly indicative of dung and therefore of pastures and mobility. Archaeobotanical data and sediment analysis from the Ombrone River, indicate an increase of human activities and of an open landscape dominated by pastures and wooded pasturelands from 2800 cal yr B.P. An increase of alder pollen together with Vicia Faba from the 1st century BC to Late Antique is probably the result of peculiar agro-sylvopastoral practice. Pollen analysis from the Etruscan-Roman town of Populonia, show us that the landscape around the city was mainly open dominated by oak forest (Q. ilex, Q. pubescens). In such an environment, we might suppose that pigs were breeding far away from the town, in the surrounding hills composed by mix oak forest and shrubs, similarly to what we observe nowadays in the dehesa-montado system of Iberian Peninsula – where pigs are literally moved around in an peculiar transhumant system of permanent mobility.

286 BEAUTIFUL BODIES: GENDER, BODILY CARE AND MATERIAL CULTURE IN THE PAST. ARCHAEOLOGY AND GENDER IN EUROPE EAA WORKING PARTY SESSION.

Theme: 6. Interpreting the archaeological record
Author: Matić, Uroš (Germany) - University of Münster
Co-Author(s): Vučetić, Sanja (United Kingdom) - University College London
Keywords: body, beauty, gender, material culture
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Beauty has a history as much as bodies do; sexual aesthetics is only one of the many notions of beauty next to proportion, sacredness, impossibility, gracefulness and romance (Eco, History of Beauty, 2004). It is often entangled with gender.
The concept of beauty has been a topic of interest for some time. Yet, it is only in the recent times that archaeologists began to approach beauty as culturally contingent and socially constructed phenomenon.
This session seeks contributions that approach beauty as a socially constructed phenomenon, through material remains of the past societies, with no geographical or chronological limits. It welcomes papers including diverse archaeological evidence and employing various theoretical and methodological models on the topics of bodily care (e.g. cosmetics use, toilet and grooming kits), body modification (e.g. tattoos, piercings, scarification), and personal adornment (e.g. jewellery, ornaments, attires).
With the aim to move beyond the textual notion of the body as a surface, we particularly encourage papers that employ the theories on the materiality of the body and queer methods, in order to disrupt epistemological and methodological assumptions underpinning much of the archaeological work on beauty and associated bodily regimes.
Papers that explore the role of bodily representations and practices in the making of bodies as well as production of beauty in relation to gender, sexuality and other axes of social difference are particularly welcomed.

01 CRITICAL APPROACHES TO BEAUTY CANONS AND ARCHAEOLOGICAL VISUAL REPRESENTATIONS: THE GENDAR PROJECT

Author: Gonzalez-Marcen, Paloma - Universitat Autònoma de Barcelona (Presenting author)
Co-Author: Jardon, Paula - Universitat de València; Picazo, Marina - Universitat Pompeu i Fabra; Rísquez, Carmen - Universidad de Jaén; Sanchez-Romero, Margarita - Universidad de Granada; Soler, Begoña - Museu de Prehistòria de València
Keywords: images, stereotypes, women
Presentation Preference: Oral

The visual image of ideas about the past has played a key role in archeological representations and illustrations have had long lasting power in spreading those ideas in popular culture and society. Thus, representation in archeology can be defined as the production of meaning through visual language to communicate a certain vision of the past. Meaning is not established through words; rather it is created by a series of pictorial conventions that are loaded with symbolic content.
In the 19th century, both Romantic and Orientalist painters and the first reconstructions of primitive humans by evolutionism generated a whole series of images that tended to establish stereotypes of beauty associated to specific cultural and moral values. They created visual dichotomies between naked bodies and dressed bodies, between disheveled or loose hair and elaborate hairstyles, etc. These dichotomies are linked to classical oppositions such as the one between nature and culture, or between barbarism and civilization. Although not exclusively, these archaeological inspired representations focused mainly on the bodies of women as visual indicators of the interpretations of past societies in the dichotomous terms already mentioned.
At present, this connotative value of archaeological images continues to appear in the majority of visual supports directed to all type of publics (historic or scientific popularization, education, publicity, visual creation, etc.). Certainly, the communicative content of these illustrations is only considered as historical representation if it contains human representations which are those that visually express the social relations and cultural values attributed to those societies of the past.
In this presentation we intend, besides reviewing these canons of representation of human bodies in historical situations, present and discuss the implications of the project "Gendar", aimed at creating new images of the archaeological past based on a critical perspective of gender relations.

02 DENTURES – AN ALL-CONSUMING FASHION

Author: Dr Anthony, Sian - Lund University (Presenting author)
Keywords: Teeth, beauty, modernity
Presentation Preference: Oral

Teeth occupy a position on the margins of the body, both inside it but also occasionally visible in a smile. They form part of the structure and shape of the face, have a vital function but can also be modified to display ideals of beauty. From the 18th century in Europe dentures were available but expensive, becoming more affordable with new materials in the 20th century. Decayed teeth caused social embarrassment and physical pain while a gleaming white porcelain smile was perceived as a sign of health and beauty. Teeth became a part of the performing and improvable body.
The prompt for this research was the excavation in Copenhagen of a modern cemetery where 20th century burials provided evidence of dental care and false teeth. A large proportion of people were edentulous (having lost all teeth ante mortem). Overwhelmingly it was women who had far fewer teeth and used dentures, in life and in death. There are multiple reasons why women might have poorer dental health than men, with pregnancy and osteoporosis important factors but another factor is revealed.
Ethnographic evidence describes the choice of some women to have all of their healthy teeth extracted when young as wedding gifts or for their birthdays, paid for by their loving families. Dentures provided a permanent solution to the expense of dental care, the fear of pain and also satisfied the desire to remain beautiful. The pressure for consumer society to pay for this improvement can be seen in the adverts for dentures implying happiness (and husbands) could only be achieved through a beautiful smile.
This paper approaches the popularity of dentures and tooth extraction as a form of body modification which combines functionality with socially constructed ideals of beauty and gender.

03 AN INTRODUCTION TO THE REPRESENTATION OF BEAUTY IN EARLY AND MIDDLE QAJAR PAINTINGS AND PHOTOS, 18 AND 19 CENTURY IRAN

Author: Dr. Dezhamkhooy, Maryam - Alexander von Humboldt Foundation, Heidelberg Universität, (Presenting author)
Co-Author: Ms. Alikhani, Elahe - UiT/ The Arctic University Of Norway
Keywords: Beauty, Qajarid Iran
Presentation Preference: Oral

According to archaeological material, historical documents, photos and paintings ,the concept of beauty was totally different in pre modern Iran, 18-19th century. The society also had different gender and sexual constitutions influencing the construction of beauty as socially constructed. Generally the Qajar society enjoyed some pluralism and a wide range of local traditions shaped the concept of beauty in different regions.
There are some paintings from the early years of Qajar dynasty, indicating almost similar beauty characteristics for men and women. Thanks to the immense photo archive from royal family , including women and men, in middle Qajar, it is supposed to occur a change in the concept of beauty and some new distinct elements were introduced. It has been put an emphasis on down above upper lip and rondure and round face as symbols of feminine beauty. There are also too many photos from ordinary women, who exposed themselves to camera , indicating that they enjoyed other forms of beauty, closer to modern standards. The standards and ideals of male beauty change also gradually.
The paper discusses the representation of a beautiful body and face in Qajarid's photos and paintings while considers comparatively the construction of beauty in literature as well. Chronologically, it attempts to discuss the construction of beauty in early and middle Qajar.

04 BEAUTY, GENDER, BODY AND MATERIAL CULTURE AMONG THE GUMUZ AND DATS'IN: AN ETHNOARCHAEOLOGY OF TWO ORAL SOCIETIES IN ETHIOPIA.

Author: Professor Hernando, Almudena - Universidad Complutense, Madrid, Spain (Presenting author)
Keywords: Ethnoarchaeology, gender, Ethiopia,
Presentation Preference: Oral

The aim of this contribution is to present data gathered on an Ethnoarchaeological project carried out with two groups inhabiting the Metema region in Northwest Ethiopia, the Gumuz and the Dats'in. Both societies' economies are of a non-intensive, hoe farming type, and have been defined by the literature as "egalitarian societies". While indeed such is the type of relationship that exists between the men, if the women are taken into consideration, clearly unequal and submissive relationships can be observed. The aim of the project (and of this paper) is to analyze the relationships between female beauty, gender identity and material culture, by paying specific attention to the latter's role in constructing a subordinate subjectivity for these women. Among both Gumuz and Dats'in women, beauty patterns are associated to a body marked by scarification, and are closely linked to colored beads. But, far from merely expressing particular beauty patterns, both dimensions (marked bodies and their associated material culture) are the inherent instruments of a gender "dispositive" (in Foucault sense). This dictates that the female body cannot possibly be conceived of without the mark of the group's law, nor without the "protection" of material culture, particularly the colored beads. Therefore, beauty is associated to the alleged fragility and vulnerability attributed to women by their respective social orders. This topic will be presented using abundant visual information, the results of interviews with women from both groups, and through an analysis of their respective socioeconomic organization patterns from a gender perspective.

05 MARKING THE COMMUNITY: THE LOCAL VARIANTS OF A FEMALE DRESS IN OLD RUS'

Author: PhD Stepanova, Iuliia - Tver State University (Presenting author)
Keywords: dress, Old Rus'
Presentation Preference: Oral

The presentation is devoted to the local variants of an Old Russian female dress of rural people of 10th – 13th centuries. The materials of burial sites are the main archaeological sources. On the one, the female dress of the Old Rus' has the characteristic features: widespread types of temporal rings, types of headdresses, the breast and wrist jewelry. On the other, the almost each local group of the population had an originality in a dress.
There are variants within one cemeteries or shared by no more than two cemeteries. It should be noted that characteristic features of the burial dress were used in practically every barrow group of the Upper Volga. Sometimes there are variants decorated in one style, or even decorated with one image, perhaps made by the same craftsman, within one and the same cemetery or on two separate sites. Such variants clearly show how the individual types of the local dress were formed. For example, it is possible to identify the following options of dress:

- belt assemblages in combination with cape clothes and chiming pendants, including headdresses with small temporal rings;
- headdress with figured plates and bracelet-sized temporal rings, belted clothes with pockets on the belt;
- a necklace from bronze bells and cowry (Cypraea) in combination with the cowry on a belt; and others.

This phenomenon is traced in the Russian traditional female costume of the 19th century. It was possible to determine by appearance of the woman from what village she comes. The local variants of a dress define the woman as translator of traditions. Such phenomenon is characteristic only for a female dress, unlike a male costume, which had no bright ethno-territorial characters in Old Rus'.

06 WHAT MAKES A MAN? THE CONCEPT OF HUMAN OF THE LATE BRONZE AND EARLY IRON AGE SOUTH BALTIC ZONE.

Author: Dr Slusarska, Katarzyna - Gdańsk University (Presenting author)
Keywords: gender, identity, headgear
Presentation Preference: Oral

What means beauty? And more interesting question is: what elements create a human being? How, through visual elements, people define themselves as a group and family members? What did they find important for their identity? Do we, archaeologists, have any instrument to reach past minds and motivations? The late Bronze Age and early Iron Age materials of South Baltic zone give very little clues for this questions. The most powerful tool - the attire, especially ceremonial - were destroyed by the fire of cremation pyre. We are left only with scarce data - personal ornaments made of bronze.
What makes situation less hopeless it the emergence of a new funeral tradition of the early Iron Age - anthropomorphic urns. Though they are far from uniformity they can be easily divide into two main groups: a group with pierced ears and without. This feature corresponds with other elements depicted on the neck and belly of the urn. Considering anthropological analyses of remains it could be interpreted as a gender mark. If we treat pierced or not pierced ears accompanied by other elements as a gender marks, what

about other "unisex" elements like hat-like lids or neck ornaments? Could they define human being in its "proper" and "accepted" by the "dress code" of a specific group way of attire? Does these elements represent the vision or beauty or have more in common with "correctness"?
The paper will explore potentials of anthropomorphic urns and elements of headgear as an identity markers.

07 A BEAUTIFUL DEAD: WOMEN'S BURIALS IN THE LATE BRONZE AGE (SOUTH URALS, RUSSIA)

Author: Dr Berseneva, Natalia - Institute of History and Archaeology, Ural Branch of RAS (Presenting author)
Keywords: Urals, women, jewelry
Presentation Preference: Oral

The study concerns the Petrovka and Alakul' cultural groups. They are currently dated from the 19 to the 15 centuries cal. BC and located in the steppe part of the Southern Trans-Urals. Cemeteries of these kindred cultures are mostly represented by kurgan cemeteries. The people were buried in a contracted position on the left side with hands in front of the face and accompanied by various grave goods and animal sacrificial deposits. Petrovka and Alakul' women were usually accompanied by a great amount of ornaments: faience and bronze beads, amulets made from animal canines, bronze bracelets, finger-rings, pendants, flat plaques, earrings, and other items. The complex female hair decorations included pendants for braids which should especially be noted. So, woman's body was decorated from head to foot at death. Male burials produced much more modest grave goods in the Petrovka period. Any items (except for pottery) were rarely found in Alakul' male graves.
This paper has two purposes. The first goal is to investigate the context of female burials with a great number of jewelry. The second is to reconstruct the gender roles of women in these societies, their social status or religion ideas related to different mortuary treatment between men and women in terms of grave goods. It is obvious that body care and image of women were very important and possibly sacred sphere in life and death during the Ural Bronze Age/

08 LOOKING FOR TROUBLE EYES, AESTHETICS AND ENGAGEMENT IN VIKING AGE ICONOGRAPHY

Author: Jensen, Bo - Kroppedal museum (Presenting author)
Keywords: Viking, metalwork, aestethics
Presentation Preference: Oral

In the Iron Age and Viking Age, Scandinavians adopted a new artistic tradition of recognisable representations of human figures. Few of these are beautiful in any classical sense, fewer accurately show human beauty, but they do show consistent emphasis on particular attributes: hair, eyes and clothing. Despite the recurrent theme of maiming in literature, this is not clearly represented in images.
This presentation will investigate how these images worked in a social context. The bewildering ambiguity and intricacy of the "art of enchantment" (cf. Gell) suggests that Viking Age aesthetics mitigated against naturalistic representation. The presentation will investigate the role of seeing, staring and meeting the gaze in Viking Age culture, arguing that en face images were less objects of visual enjoyment and more subjects for confrontational enactments: the hard stare so often depicted was not intended to be beautiful. Thus, Viking Age visual culture offers an important alternative to the consumerist "pornographic" visual culture of early and high modernity (cf. McKlintock, Rubin), and challenges archaeology's traditional way of representation: looking for beauty in this images may be missing the point.

09 BODIES OF COLONIALISM. IDENTITY AND BODILY CARE IN THE MARIANA ISLANDS.

Author: Mr Moral de Eusebio, Enrique - Universitat Pompeu FabraMs Peña Filiu, Verónica - Universitat Pompeu Fabra
Co-Author: Dr Montón-Subías, Sandra - Universitat Pompeu Fabra (Presenting author)
Keywords: Gender, Body, Colonialism
Presentation Preference: Oral

In this paper, we will present a long-term approach (from prehistory to the present) to changes and continuities undergone by the body and its care, as well as by the material culture associated with it in Guam and the Mariana Islands (western Pacific). During the first 1521 world circumnavigation, contact between Pacific islanders and Europeans took part for the first time in the Mariana Islands. Some years later, these islands would become incorporated into the colonial network of the Spanish Empire.

The previous processes brought in contact oral and literary societies of a vast cultural distance and different ways of being a person. Following previous works in archaeology and the social sciences, we understand the body as an active element in the construction of the self, gender and group membership. This is also why colonial agents targeted the native body as a land to be conquered through disruption and "domestication" of its social practices (such as, for instance, nudity).

To better understand the implications of the colonial processes, we will briefly address the way in which current Chamorros, especially cultural practitioners and men involved in self-determination movements, are recovering ornaments and practices related to the bodily care of the ancient Chamorro society in a current process of ethnogenesis.

10 WRETCHED BUT BEAUTIFUL KUSH: COSMETIC UTENSILS AND THE ADOPTION OF EGYPTIAN IDEALS OF BEAUTY IN NEW KINGDOM NUBIA

Author: MATIC, UROS - Westfälische Wilhelms Universität-Münster (Presenting author)
Keywords: Egypt, Nubia, cosmetics
Presentation Preference: Oral

This paper aims to contribute to the understanding of changes of embodied lives and adoption of Egyptian cultural values and ideals of beauty in Nubia (modern south Egypt and north Sudan) during the New Kingdom (c. 1550-1069 BC) through the study of accessories related to bodily care (cosmetic substances and cosmetic utensils). The objects which can be classified as cosmetic utensils are cosmetic jars which originally contained ointments, palettes for grinding make up, kohl applicators, their cases and tubes, kohl pots, hair pins, combs, "hair curlers", razors, tweezers and mirrors. During the New Kingdom these cosmetic utensils are found both on sites in Egypt and in Nubia allowing mutual comparison of objects and their contexts in both regions in order to answer the following questions: If and how did the care of the body change in Nubia during the New Kingdom, if this can be related to the process of "colonization" and what was the role of newly adopted accessories in Nubia in the very same process? Why and how and by whom are Egyptian values of beauty and bodily care adopted in New Kingdom Nubia? Is the adoption of these values and ideals of beauty instigated by the Egyptians and which among them? Is it possible to identify a specifically local use of these objects not attested in contemporary New Kingdom Egypt?

11 PERFUMES, MAKE-UP AND JEWELRY: BODILY CARE AND GENDER IN THE PHOENICIAN AND PUNIC WORLDS, 8TH-4TH CENTURIES BC

Author: Ferrer Martin, Meritxell - Universitat Pompeu Fabra
Co-Author: López-Bertran, Mireia - Universitat de València (Presenting author)
Keywords: Phoenician-Punic, Gender, Body-care
Presentation Preference: Oral

While over the past few years several studies have highlighted the importance of bodily care practices for the politics of identity, these perspectives have had little impact in the Phoenician-Punic context. In fact, the direct relationship that has traditionally been established between these practices and femininity has given rise to the idea that these practices were unimportant and alien to historical and political developments in Phoenician communities. They have only been approached through mere descriptions or formal typologies.

In response to these strongly androcentric discourses, the main aim of this paper is to establish the importance that bodily care had for Phoenician peoples in constructing and materializing their personal and familial identities. In the second place, the paper aims to recover the agency of the women who, through these practices, took care of their bodies and those of their close ones and, in this way, of their entire community. Through material culture, iconography and written sources, our paper examines bodily care practices in several aspects of the lives of these peoples, such as domestic, ritual and funerary contexts.

12 CREATING GENDER... CREATING BEAUTY...

Author: Mr. Anton, Alin - PRAHOVA DISTRICT MUSEUM OF HISTORYAND ARCHAEOLOGY
Co-Author: Dr. Ciuperca, Bogdan - PRAHOVA DISTRICT MUSEUM OF HISTORYAND ARCHAEOLOGY (Presenting author); Dr. Măgureanu, Andrei - "Vasile Pârvan" Institute of Archaeology of the Romanian Academy in Bucharest
Keywords: Lower Danube, metalworking
Presentation Preference: Poster

In this paper we want to ask questions about gender starting from one material culture aspect: casting moulds from the Lower Danube. We will underline the importance of those objects for understanding different aspects of everyday life and not only, because there is a beauty of living ones and a beauty of dead ones.

Beauty and gender in 6th-7th century in Lower Danube area are topics to debate but we think an interesting aspect of the problem is the way that those were formed: what was first demanding or offering? And a discussion about the production capabilities of the area can be a clue about identifying the gender differences in costume, about the origins of a certain aspect of a dress or a warrior belt set, about the roman or nomad influence in taste and technology, about what is common and particular, about the differences between the costume of daily life and ceremonial one, if there such differences there are understandable for us.

Finally, what was first: the gender/beauty/fashion that demands specific artifacts to express itself?; the "creators"/goldsmith that suggest some direction?; or a combination of both situation? And evidence for metalworking, next to other artifacts discovered in the studied area, can be an ideal entry-point for such debate.

287 THE ODD, THE COMPLEX AND THE CURIOUS – FINDING AND INTERPRETING STRANGE BURIAL PHENOMENA IN THE VIKING WORLD

Theme: 6. Interpreting the archaeological record
Author: Moilanen, Ulla (Finland) - University of Turku, Finland
Co-Author(s): Therus, Jhonny (Sweden) - University of Uppsala, SwedenEtu-Sihvola, Heli (Finland) - Laboratory of Chronology, University of Helsinki, Finland
Keywords: graves, burials, mortuary customs, death
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Burial archaeology usually approaches graves as expressions of different traditions, cultures or religions. Graves and burials may be classified as types within chronological sequences, and the phenomena which do not fit in these types are often regarded as deviant or disregarded completely. Today, there is an increasing interest in previously overlooked phenomena and a questioning of the older models regarding what burials are supposed to be. The burial customs of the Viking World are often described as homogenous, but at the same time they are considered to be influenced by local practices. Mortuary customs are complex, incorporating a wide range of practices representing commemoration, necromancy, divination, and sociogenic rituals. In this session the focus will be on the complexity of burial practices in the Viking World and the new ways to find, analyze, and interpret them, as new approaches and methods may shatter old pre-conceptions of what a grave should be like in a certain context. How can the deviant or previously disregarded phenomena be explained, why can we not find all the burials or bones in the graves we find, and what other factors affected the burial than religion or belief systems? The emphasis is on how burial customs change, and are used to facilitate change, in the meeting between religions, between cultures and in new environments. We welcome papers dealing with Scandinavian material as well as research on contemporaneous burials in the geographical areas influenced by the Nordic cultures: Finland, Baltic countries, Russia, and the British Isles.

01 ON THE BRINK OF A NEW ERA: VIKINGS, CHRISTIANS AND CHRISTIAN VIKINGS – OLD TRADITIONS AND NEW FAITH?

Author: Ms Wenn, Camilla Cecilie - Museum of Cultural History University of Oslo (Presenting author)
Keywords: burial, change, religion
Presentation Preference: Oral

The meeting of old tradition and religion with Christianity has been described and interpreted in different ways. An one end, some see a harsh break, the two sides clashing and Christianity more or less violently overcoming the old ways. At the other end is the idea that, while controversies did occur, there was a gradual change towards new ideas and practices. In southeastern Norway, the change from traditional pagan Viking graves to Christian graves happened during the 10th and 11th centuries. The graves are usually classified as pagan or Christian by grave goods or lack thereof, grave type, and/or location. The distinctions are however not always straight forward. The paper will present examples of graves that do not fit the norm, and discuss how they may partake in a better understanding of the interplay between new and old traditions in a time of change.

02 BONE HEAP GRAVES IN INHUMATION CEMETERIES IN LATE IRON AGE FINLAND

Author: Puolakka, Hanna-Leena - University of Oulu (Presenting author)
Keywords: burial, christianization, cremation
Presentation Preference: Oral

In my research, I'm studying eight different cemeteries from the late iron age Finland. These cemeteries have both cremation and inhumation burials, sometimes positioned in the same grave pit. The type of cremations in question are often called 'bone heap graves' as they have been observed to been buried as a stack of bones inside a vessel of some kind, and not burned at the location. The eight cemeteries date from 11th to 14th century, but the dating of the different types of graves inside the burial sites has been more complicated. The most common explanation for this phenomenon has been pre-Christian traditions turning into Christian ones in the wake of Christianity arriving to the area. This explanation however doesn't fully explain the phenomenon in which the cremated bone heaps are occasionally located on top of the inhumation burials and thus, are stratifically younger.

This phenomenon was first observed in the 19th century, but no one has searched for an explanation for this phenomenon as a whole. Earlier studies have discussed these bone heap graves only briefly and often discarded them as mere anomalies and curiosities in what has otherwise been seen as early Christian cemeteries. In my research, I scrutinize for possible explanations to this phenomenon, with comparing the sites and the individual burials. I will also study the relationship between different types of burials, the possible change in the burial customs and the reasons behind the differencies. I will pay special attention to the traces of the probable change in the belief systems, like Christianization, and the changes in the social environment. Study shows, that the process of Christianization, while present, might not be as simple or straightforward as has been previously thought.

03 THE PROBLEM OF THE MISSING BONES. HOW SCATTERED BONES AND FRAGMENTED BURIALS HELP CREATE A PLACE.

Author: PhD candidate Therus, Jhonny - Uppsala university (Presenting author)
Keywords: Cremation, burial, viking
Presentation Preference: Oral

It has long been a fact that during the Viking Age not all dead were given a burial we can identify today. When archaeologists started to pay attention to cremated bones from the visible burials it became obvious that most burials never contained all the bones of the cremated individual, or accompanying animals, even if accidental loss was accounted for. The reason these bones are missing might be found in cosmogonic and ancestor venerating rituals.

This presentation looks at East Swedish cremation burials during the Viking Age and the problem of the missing bones. Scattered bones are suggested to be used to create a kind of monumental, or historical, gravitation creating a reciprocal entanglement between the living, the dead and the landscape as well as transforming space into place. It also questions two common archaeological notions, that burials are foremost containers for a dead body and that inhabited areas contain a random scatter of cremated bones.

04 ANTLERS AND DOMESTIC ANIMALS IN SÁMI GRAVES – NEW INTERPRETATIONS OF CULTURE CONTACTS AND INTERNAL DEVELOPMENT

Author: PhD candidate Piha, Minerva - University of Turku, Finland (Presenting author)
Keywords: graves, lexicology, Sámi
Presentation Preference: Oral

In the inland regions of central Sweden and Norway a burial custom called lake graves has been found dating from Pre-Roman Iron Age to the Viking Age and beyond. The graves have been interpreted as part of the early Sámi culture in the area, but strong contacts with other peoples in the nearby regions are visible.
I will look at the elk and reindeer antlers placed on the graves as well as the bones of domestic animals in the graves. I will examine these phenomena from a perspective of historical lexicology which, combined with archaeology, can give a new interpretation of the phenomena.
While the construction of the graves seems to resemble the Scandinavian graves in southern Sweden, the antlers are seen as the result of internal development of the Sámi culture. In the lexicon borrowed from Proto-Scandinavian into Sámi language we find e.g. the word aevsie 'the part of the skull that comes away with the antlers'. I will ponder why the word is borrowed from Proto-Scandinavian if the antlers belong to the original Sámi culture.
Bones of sheep or goat are found in the graves from the beginning of the Common Era and they only increase by the time of the Viking Age. From the historical times it is known that the Sámi people did not practice animal husbandry. This has affected the researchers to overlook the meaning of the bones.
However, the Proto-Scadinavian loanwords in Sámi prove that animal husbandry was relatively intensive among the Sámi already in the Roman Iron Age. Based on the combination of archaeology and linguistics, I will present a new interpretation of the lake graves and the early Sámi culture in central Scandinavia. I will also examine how animal husbandry fits together with the antlers of (semi)wild animals on the graves.

05 AN EQUESTRIAN BURIAL FROM FREGERSLEV, DENMARK

Author: Mrs Bagge, Merethe Schifter - Museum Skanderborg
Co-Author: Mr Hertz, Ejvind - Museum Skanderborg (Presenting author)
Keywords: Equestrian Burial
Presentation Preference: Oral

In April 2017, an equestrian burial from the late Viking Age is being excavated. The content and the complexity of the grave is therefore at the time of writing this abstract yet to be discovered. Based on golden fittings from a bridle, which were found in the trial excavation, the grave goods and the personally equipment are presuming to be exceptional

rich. Preliminary analysis of a small sample from the grave revealed the golden items and pieces from the bridle and shows good circumstances for preservation as traces of phytoliths and organic materials are present.
Equestrian burials have not been found in Denmark since 1983 and a great part of the elderly finds were excavated by non-experts. The excavation can profit from brand new methods of preservation and natural science, and thereby contribute with a number of details about for example grave rituals. The potential for method development and research is unique.
The presentation will focus on results from this spring's excavation and the potential for future research. The grave from Fregerslev can contribute to research on DNA, protein analysis, lipid analysis, the construction of chamber graves, grave rituals, the grave costume among the Viking elite and social structure.

Ejvind Hertz and Merethe Schifter Bagge

06 CHAMBER GRAVES IN FINLAND DECONSTRUCTED

Author: PhD candidate Moilanen, Ulla - University of Turku
Co-Author: PhD candidate Etu-Sihvola, Heli - University of Turku; University of Helsinki (Presenting author)
Keywords: Viking, burial, chamber
Presentation Preference: Oral

Chamber graves have been found in several trade and settlement sites connected to the Viking trade routes, also from western Finland. Where did this burial form originate? It was surely not a pure Viking innovation. The tradition of constructing shallow chambers emerged in Finland already during the Merovingian period, in the end of the 6th century. This was possibly due to influences deriving from the Swedish mainland. Close connections crossing the Baltic Sea are visible in the material culture throughout the Finnish Merovingian period, and for example migration and trade relations have been suggested as sources of the chamber burial tradition.
During the Viking Age, southwestern Finland was closely linked together with Mälaren area in Sweden, which can be seen in many Finnish find types found in the area and of course from the numerous finds in Finland, which were imported via Scandinavian contacts. The custom of burying the dead into inhumation graves continued through the Viking Age, in contradiction with the other regions in Finland, where similar grave gift combinations were also present, but cremation was still the main type of burial until the 11th century.
Finnish Viking Age chamber burials have been interpreted as signs of high status. But can it be really said that all chamber graves clearly represent an elite burial type? In our paper we compare the structures and grave gifts found in Scandinavian, Karelian and Rus´ chamber burials with the finds from southwest Finland and seek answers to these questions.

07 MANY WAYS TO VALHALL - AN EXAMPLE FROM VESTFOLD IN NORWAY

Author: Dr. Gollwitzer, Martin - Vest-Agder fylkeskommune (Presenting author)
Keywords: Viking age, burial
Presentation Preference: Oral

In 2009 and 2010 the author excavated a site with features from bronce age to medieval times in Hesby near Tønsberg in Vestfold, Norway. The site lies in on one of the core areas of viking age Norway not far from the famous sites of Gokstad and Oseberg. In a part of the site there where found and excavated four viking age burials. One of the graves was a boat grave, but the three other burials had a more unusual inner construction. The graves where robbed but the remaining finds showed that the dead where equipped with grave goods typical for viking age burials of the region. Even if those graves at a first glimpse seemed to be quite usual, a combination of archaeological methods and scientific analyses made clear that the Hesby graves where far more complex. Osteological analyses of the bone material showed for example that in the graves where buried more than one person. The analyse of a micromorphological sample of one of the graves gave interesting results in respect of the graves taphonomy.
It is obvious that our concept for the understanding of viking age burial is mainly based on old finds and is highly influenced by the research historical situation.
The results of the analyses of the Hesby graves show clearly that our knowledge of viking age burial customs are still limited and that the key to the understanding of those customs is the use scientific analyses and refined excavation techniques.

292 TRANSNATIONAL PERSPECTIVES ON THE LEGACY OF ANCIENT PASTS IN CONTEMPORARY EUROPE

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Bonacchi, Chiara (United Kingdom) - University College London
Co-Author(s): Hingley, Richard (United Kingdom) - Durham University, Department of ArchaeologyBabic, Staša () - Filozofski fakultet Beograd, ArheologijaPopa, Catalin (Netherlands) - Leiden University
Keywords: Iron Age, Roman, Medieval, Heritage
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

This session aims to bring together researchers involved in interdisciplinary studies examining the contemporary heritages of Iron Age, Roman and Early Medieval pasts in Europe. It will present and discuss the regional variability of the methodological approaches that have been adopted and the results achieved so far. In inviting contributions, we embrace a broad understanding of heritage as the 'uses, values and associations' carried by the historic environment for different stakeholders (Smith and Waterton, 2012:1). This is a meaning of heritage that transcends 'authorised heritage discourses' and acknowledges the stakes of a wide range of individuals and groups (Smith and Waterton, 2012:2). Questions that we would like to ask are: how are different materials and ideas relating to Iron Age, Roman and Early Medieval pasts lived, enacted, and interpreted across European territories? What regional commonalities or specificities can be identified in the ways in which heritage values are shaped, and emerge from different contexts of production and consumption? What is the contemporary legacy of historical structures which cut across the roughly 1,000 years between 700BC and AD800? How have these contributed to place-making and identity trans(formation)s that are visible today? What has been the impact of formal archaeological practices and the role of archaeologists in these processes?

Together with the organisers, the following have already showed an interest in participating: Kate Sharpe (Durham, UK), Manuel Fernandez-Gotz (Edinburgh, UK), Andrew Gardner (UCL, UK), Frank Siegmund (Heinrich Heine University Düsseldorf, Germany), Tina Paphitis (UCL, UK), Andrea Biondi (University of Florence).

01 INTRODUCTION

Author: Bonacchi, Chiara - University College London
Co-Author: Hingley, Richard - Durham University; Babic, Stasa - Filozofski fakultet Beograd (Presenting author); Popa, Catalin - Leiden University (Presenting author)
Keywords: Europe, Network, Heirtages
Presentation Preference: Oral

In this introductory talk we will outline the aims of the session and our intention to start building a European network of researchers examining the contemporary heritages of Iron Age, Roman and Medieval pasts and their variability across Europe.

02 INSISTENT DUALITIES AND IMAGES OF ROME IN BRITAIN AND WESTERN EUROPE

Author: Prof. Hingley, Richard - Dept. of Archaeology, University of Durham (Presenting author)
Keywords: dualities, genealogy, nationalism
Presentation Preference: Oral

This paper will address the idea of 'insistent dualities', an approach first outlined by Mary Beard and John Henderson (1999). It will focus particularly upon the duality of the conception of civilization and barbarity derived from the writings of classical authors on the north-western peripheries of Europe (Gonzalez-Ruibal 2010). Although Roman archaeologists have been critiquing this conception since the 1980s, it remains prevalent in popular media in the UK (Hingley 2015). This paper will also address an issue at the heart of the current 'Ancient Identities' project (see http://ancientidentities.org)—the opportunities provided by and limitations of such dualistic conceptions of the Roman past. The aim of this project is to explore the currency of ideas of Iron Age and Roman heritages for a wide variety of stakeholders in contemporary Britain; this paper constitutes an introduction to our aims and frameworks.

Beard, M. and J. Henderson 1999: 'Rule(d) Britannia: Displaying Roman Britain in the Museum', in N. Merriman (ed.) Making Early History in Museums. Leicester, Leicester University Press, 44-73.
Gonzalez-Ruibal, A. 2010: 'Colonialism and European Archaeology', in J. Lydon and U. Rizvi (eds.) Handbook of Postcolonial Archaeology. Left Coast Press, Walnut Creek, 39–50.
Hingley, R. 2015: 'Working with Descendant Communities in the Study of Roman Britain: Fragments of an Ethnographic Project Design', in C.N. Cipolla and K.H. Hayes (eds.) Rethinking Colonialism: Comparative Archaeological Approaches. Gainesville, Fl, University Press of Florida, 161–89.

03 THE LEGACIES OF TWO EMPIRES: ROME, BRITAIN AND BREXIT

Author: Dr Gardner, Andrew - UCL Institute of Archaeology (Presenting author)
Keywords: Identity, Imperialism, Brexit
Presentation Preference: Oral

The momentous events of 2016 cast debates about heritage and identity in new light, as the relationships between national and international communities come under intense scrutiny, while the knowledge claims of academics and professionals are increasingly disregarded. Shaping a critical scholarly response to these events is a challenging but crucial task that must incorporate insights from the now considerable body of investigation into the historical politicisation of heritage. In this paper, I will investigate the connections between some of the identity politics surrounding the UK's referendum on EU membership and the nature of imperial and post-colonial identities, taking the British and Roman empires as relevant contexts for recent developments. I will argue that the Roman imperial presence in Britain began processes of identity formation which, when layered and transformed with subsequent episodes in the crafting of 'Britishness', have left a legacy of concepts which are still evoked today in the debates about the UK's relationship with Europe, and about its own internal dynamics as a composite nation. I will also argue that there are parallels between the transformation of Roman identity through imperial processes and similar changes to British identity over time, the latter having important consequences for some of the motivations behind the vote to leave the EU.

04 EMPIRES, 'BARBARISM' AND POLITICAL ACTIVISM: REHASHING THE PAST FROM THE IRON AGE TO BREXIT

Author: Dr Bonacchi, Chiara - University College London (Presenting author)
Keywords: Digital Heritage, Frontiers
Presentation Preference: Oral

This paper considers the ways in which the past, from the Iron Age to the Medieval period, is called upon in relation to contemporary discourse on mobility and frontiers. It will focus especially on articulating how the two European myths of origins as defined by Kristian Kristiansen (1996) are upheld to support the 'pro-leave' and/or 'pro-remain' camps in discussions about 'Brexit.' The first myth stresses how such origins are to be found in the valour and freedom of 'barbarism', as opposed to the "despotism of the classical empires". The second myth of origin, instead, highlights the civilising power of the Romans, which is considered to have been obscured by the 'barbarian' forces that some feel to have caused the end of the Western Roman Empire. Both of these two myths revolve around the centrality of the Roman Empire, an idea on which the European Union has drawn in its formative phase. The importance and uses of a second idea, that of the Holy Roman Empire, however, will also be discussed. Based on analysis undertaken using social media 'big data', the paper will show how ideas about the past are re-hashed, by whom and based on what political believes and ideological positions. In doing so, I will also introduce the methodological approach of the the AHRC-funded project 'Ancient Identities Today', of which this research is part. I will especially highlight the theoretical, ethical and technical implications of using large datasets in digital heritage research and how these can be combined with the analysis of 'smaller data'.

05 EARLY ENCOUNTERS: FIRST IMPRESSIONS OF IRON AGE AND ROMAN PEOPLE IN MODERN BRITAIN.

Author: DR Sharpe, Kate - Durham University (Presenting author)
Keywords: Roman, Iron-Age, Ethnography
Presentation Preference: Oral

The Ancient Identities project will explore ways in which people in modern Britain respond to, identify with, and exploit their early heritage. In doing so we will seek to understand the many and varied contexts in which public views are shaped, and the ways in which they are influenced by contemporary media, academic communications, and heritage

policies. As adult participants in the world, we each draw on our own individual experiences, circumstances and ideologies when we engage with our heritage. But what about those who have yet to develop a sophisticated understanding of their personal place in society, and who are encountering the past for the first time? What messages are we presenting to pre-school and primary age children, either directly or unintentionally, and how are these received, interpreted and built upon? This paper will present preliminary findings from ethnographic studies probing the ways in which young children first meet the ancient people of Britain and how those early encounters may impact their longer term views of these cultures.

06 CORNISH HERITAGE: POLITICS, NATIONALISM, AND THE ECHOES OF IMAGINED CELTIC PASTS

Author: Dr Orange, Hilary - Ruhr Universitat Bochum (Presenting author)
Keywords: Cornwall Celtic Identity
Presentation Preference: Oral

This paper will address the contemporary politics of heritage in Cornwall. Modern day Celtic-Cornish identity rests of the notion of ancestry to Ancient British peoples, and the continuity of language and other shared cultural traits, nested within the contemporary geographic context of the Celtic nations. The idea of Cornwall as a separate place and of Cornishness as a separate identity (as distinct from England and Englishness) runs through various aspect of modern-day life in Cornwall and is largely, I would argue, undisputed within the area. Indeed, the Cornish people have had some success is gaining recognition of their minority status, and Cornish culture is commonly seen as worthy of protection and celebration.

In this paper, I will first outline the historical scene of 19th century Celtic revivalism in Cornwall and in regards to archaeological heritage, how 19th century deindustrialisation, antiquarian pursuits, and a nascent tourist industry led to the marketing of Celtic imagery to English tourists who arrived on the newly built railways seeking a land of difference. Secondly, I will draw a map of nationalist movements in the late twentieth century – from pressure groups, to progressive parties and militant organisations – to illustrate the various shades of Cornish nationalism and how these pertain to various aspects of heritage. Thirdly, I will draw these economic, political and cultural threads together by giving a few discrete examples of how heritage in Cornwall (from prehistoric sites, to King Arthur to post-industrial ruins) becomes entangled with and co-opted into ideas of Cornishness, and continues, ultimately, to produce echoes of imagined Celtic pasts.

07 THE PERCEPTION AND LEGACY OF ABANDONED BUILDINGS IN THE NORTH-WESTERN PROVINCES OF THE ROMAN EMPIRE

Author: Mhr. Dodd, James - VU Amsterdam (Presenting author)
Keywords: Abandonment, Perception, Legacy
Presentation Preference: Oral

The North-Western Provinces of the Roman Empire were littered with a broad array of abandoned or reused stone buildings during the immediate post-Roman period. The history of many of these buildings is difficult to discern, and the experience of abandonment has been somewhat neglected in favour of reconstructing the occupation transformations of these structures. Work has traditionally concentrated on the transformation and reoccupation without a significant break of occupation, in what is usually deemed 'squatter' occupation. This has demonstrated that reuse and changing circumstances are evident at a wide array of rural (Heeren 2015, Van Ossel 1992, Dodd unpublished), military (Wilmott 1997, Collins 2015) and religious (Henrich 2010, Rahtz 1957) sites. Despite this, little work has been done on the abandonment and sporadic re-use of these buildings, their legacy within the landscape and their meaning to the new early medieval elites of Western Europe. This paper will tie these together by analysing the historical and archaeological perspectives of Roman structures in the early medieval world, as well as advancing a more theoretical model for the abandonment of these building, demonstrating that each building had a unique post-occupation history, and most importantly, that the phenomenon of 'stone robbing' need not be as disparaging as suggested.

08 CROSSING DIVIDES – POPULAR CELTICISM AND ACADEMIC NARRATIVES IN NORTHERN SPAIN

Author: Dr Fernández-Götz, Manuel - University of Edinburgh
Co-Author: Prof Ruiz Zapatero, Gonzalo - Complutense University Madrid (Presenting author)
Keywords: Galicia, Celts, Identity
Presentation Preference: Oral

In the so-called 'Celtic' nations of the Atlantic fringe, the idea of a Celtic past has been particularly influential in order to support present-day purposes, from political discourses to music festivals and tourist promotions. This paper will focus on the dialectics between scientific discourse and popular culture in the northern Iberian Peninsula, with a particular focus on Galicia. This region is conceived in Spain as the embodiment of everything 'Celtic,' from music to landscapes and traditional festivities. At the same time, most archaeologists reject the idea of Celticity in the region, which creates an increasing divide between academic studies and popular culture. Rather than ignoring or caricaturing popular Celticism, we will argue that scholars should critically engage with popular debates in order to clarify uses and abuses.

09 LUNA CELTA (SOLOSANCHO, ÁVILA, SPAIN): IRON AGE ALIVE!

Author: Dr. González Álvarez, David - Durham University, UK; Institute of Heritage Sciencies (Incipit), Spain (Presenting author)
Co-Author: Mr. Rodríguez Hernández, Jesús - Complutense University of Madrid, Spain
Keywords: Re-enactment, Identities, Public-Archaeology
Presentation Preference: Oral

Historical re-enactments are a growing phenomenon across Europe. The Luna Celta (Celtic Moon) festival is one of the most prominent examples of Iron Age re-enactment events in Spain, where Iron Age constitutes a strong referent for contemporary regional identities. Every August since 2005, the impressive oppidum of Ulaca and the nearby villages of Villaviciosa and Solosancho in Ávila (Central Spain) become the scenario for a 3-day festival in which the pre-Roman vettones come alive through theatre, parades, music, feasts... and party. After studying 2016 and 2017 Luna Celta festivals through ethnographic fieldwork in the context of the REFIT project (Resituating Europe's First Towns), we will reflect on historical re-enactments as social contexts where the public engage with cultural landscapes and heritage, and build 'bottom-up' historical narratives about the Iron Age. Some of our colleagues assume that these festivals are a sort of quaint and poorly informed events in scientific terms. However, we will consider historical re-enactments as contemporary cultural representations. This way, re-enactment events have revealed being significant contexts for the study of the public perceptions about the past from a Public Archaeology perspective. In addition, we will evaluate the possibilities of historical re-enactments such as Luna Celta for the dissemination of archaeological narratives.

10 "INVISIBLE" LOMBARD HERITAGE IN ITALY: THE CASE STUDY OF FIESOLE

Author: Student Biondi, Andrea - University of Florence (Italy) (Presenting author)
Keywords: Lombards, Italy, Heritage
Presentation Preference: Oral

The small town of Fiesole, Italy, is known, above all, for its magnificent view on Florence and for its impressive roman ruins which, today, attract a large number of primarily international tourists. Fiesole's small archaeological museum, founded at the end of 19th century and variously renovated over the years, is instead largely neglected by visitors and especially so when it comes to its early medieval sections. This is despite the fact that the museum has recently included a section about the Lombard period in Fiesole, and despite the presence of a Lombard cemetery in the town centre which has been excavated for ca. thirty years with involvement of the local population. Through the case study of Fiesole, this paper discusses the 'issue' of the greater prominence and public understanding of the Roman period compared to the Early medieval one, in Italy. It will then show how, based on a synergic approach of 'light' and public archaeology and through strategic collaborations with stakeholders including local groups, the Superintendence and the local archaeological museum, it will be possible to re-balance the visibility of the post-roman period of history in Fiesole. The reasons why this is important for identity formation processes will also be discussed.

11 SEARCHING FOR THE ROMAN IN THE EUROPEAN RECEPTION OF ANCIENT EGYPT

Author: Langer, Christian - Freie Universität Berlin (Presenting author)
Keywords: Egypt, Europe, Rome
Presentation Preference: Oral

Egyptology has been mainly a European-dominated academic field since its inception at the turn of the nineteenth century CE. As an effect, European audiences have widely received ancient Egypt and its rich cultural heritage, Egyptomania being only one facet. In this context, different aspects of ancient Egyptian heritage may not have received an equal amount of attention. The public sphere may perceive Egypt as a rather monolithic civilisation, mainly to be associated with pharaonic glories. That poses the question to what extent the Roman domination of Egypt is a factor in the reception of ancient Egypt. So far, studies have usually dealt with ancient Egyptian history in general, which resulted in an emphasised visibility of pharaonic Egypt in European Egyptomania and the wider reception. This contribution seeks to investigate specifically the input of Roman Egypt into European imaginations of ancient Egypt. An interesting question is whether there are different reception traditions – e.g. if there are distinct narratives utilised by the political or entertaining spheres – beyond academic research. How does the wider public regard Roman Egypt as part of Egyptian history rather than an annex to Roman history? How is Rome considered a legitimate part of Egypt beyond popular imaginations of the triangle Cleopatra-Caesar, Mark Antony, and the associated downfall of 'true' Egypt? What is Rome's image connected to this? An example for the political sphere may be Egyptian obelisks, which have become a symbol of political power throughout the global north – yet in what way is the adoption of obelisks by European power elites an actual imitation of something specifically Egyptian rather than the emulation of an earlier Roman appropriation? This contribution considers various cases in approaching an answer to the Roman contribution to the reception of Egypt in Europe and assessing the influence of academic research.

12 EXHIBITING ACROSS BORDERS – NEGOTIATING HYBRIDITY AND IDENTITIES

Author: Mr Paludan-Muller, Carsten - NIKU (Presenting author)
Keywords: Hybridity, identity, Conflicts
Presentation Preference: Oral

Armenian heritage is abundantly present in the Turkish Republic. Some of the most iconic monuments from the Armenian medieval period are found in and around the walled city of Ani near the closed border to Armenia, which is also the borderlands between Anatolia and Caucasus. In 2016 Ani became included on the World Heritage List. The city has a strong symbolic significance in Armenian history. But its significance is also derived from its role as a commercial hub, a meeting place and a point of crystallization for different cultural impulses through time.
It has long been an ambition to expose this material of extraordinary quality and importance in an exhibition to be shown in both Armenia and Turkey. The two countries share a common border, but do not have diplomatic ties. Often conflicts in their shared past is an obstacle to mending their relations. But in the case of the medieval past, experts from the two countries cooperate. A joint exhibition project will expose the results of this and help develop further cooperation to safeguard a shared but threatened legacy. The paper will discuss the meaning, the context and the conditions for the development of the project.

13 THE IMPORTANCE OF BEING ANCIENT: THE ROLE OF ROMAN EMONA FOR THE IDENTITY OF LJUBLJANA AND SLOVENIA

Author: Mrs. Zupanek, Bernarda - Museum and Galleries of Ljubljana (Presenting author)
Keywords: antixity, identity, heritage
Presentation Preference: Oral

In the centre of Ljubljana, the capital of Slovenia, in the area still denoted by the toponym "Gradišče" (= hillfort), several sites, monuments and other markers preserve the memory of the Roman colony of Emona. The remains of Emona presented there have a relatively short history. Active archaeological research of Emona only stretches back 100 years, with the most intense investigations and abundant archaeological discoveries as well as the majority of presentations appearing in the 1960s-1980s.
It would be wrong to suppose that the monuments, texts and images of Emona are only slightly over 100 years old; they were shaped, altered, allowed to fall into oblivion and rediscovered at least from the 17th century onwards. They were mainly generated by the citizens of Ljubljana whose aim was to find in the Roman town an ancient, respectable, different past of their hometown, Ljubljana. Three main stages are detectable and discussed.
This reveals the Emonan/Roman past as a tool enabling us to comment on the present moment, particularly on the political and social tensions, and as a tool empowering us to mitigate and/or resolve the latter by constructing a more suitable past. Stages during which the Emonan imaginary was re-shaped at an increased pace are generally periods involving social and/or political turmoil. In such periods, the inhabitants of Ljubljana always recognised in their Roman past some symbolic capital which helped them confer a meaning on, or change, a specific historic situation. The memory of Ljubljana's mythical or historical predecessor was also refreshed and consolidated in less turbulent moments, and are related to changes in the manner of reflecting on the past, to changes in mentalities that can only be noticed in the longue durée perspective.

14 NATIONAL SPACE AND THE 'AGE OF MIGRATIONS': FINDING ROME'S BARBARIANS IN MODERN ROMANIA

Author: Hanscam, Emily - Durham University
Co-Author: Prof. Hingley, Richard - (Presenting author)
Keywords: Migration, Identity, Romania
Presentation Preference: Oral

During the period known as the 'Age of Migrations,' lasting from c. 300-700 CE, tribal groups from the Eastern Steppe migrated west and discovered the remnants of Roman civilization. Bridging Late Antiquity and the Early Middle Ages, scholarship has tended to focus on the Roman side of the story, blaming the 'barbarians' for the decline and fall of the Empire (Curta 2005). The territory of modern Romania was host to many crucial encounters during this period, which are better understood from classical sources like Jordanes' Getica than from archaeological research. Yet this migratory space is a key aspect of the Romanian national narrative, which focuses on the many de-populations and re-populations of the territory, employing these grey areas of the past to propagate a particular modern Romanian identity. This paper aims to better understand the relationship between the so-called migratory peoples and the Romanian national space, by examining the presence of these peoples in Eastern European historiography, and the contemporary legacy of migration in Romania.

Curta, F., 2005. Frontier Ethnogenesis in Late Antiquity: The Danube, the Tervingi, and the Slavs. In Curta, F. (ed.), Borders, Barriers, and Ethnogenesis. Turnhout, Belgium: Brepols Publishers. pp. 173-204.

15 PUBLIC AND PROFESSIONALS NEGOTIATING HERITAGE - BOUNDARIES OF PARTICIPATION

Author: Dr Cvjeticanin, Tatjana - National Museum in Belgrade
Co-Author: Prof. Babic, Stasa - Department of Archaeology, Faculty of Philosophy, University of Belgrade (Presenting author)
Keywords: heritage, participatory practices
Presentation Preference: Oral

The contribution aims to question the limits of professional authority in relation to public perception of (un)controversial heritage. Moving from the authorized heritage discourses towards participatory practices in heritage governance brings forward various relationships between stakeholders, broadly distinguished into two groups: public and professionals. However, neither of these groups is homogeneous, and in order to move towards a better mutual understanding of all the actors, it is vital to recognize possible subsections of these groups, e.g. professionals as both academics and practitioners, with different experiences, aims and priorities. Furthermore, these lines of demarcation, as well as modes of cooperation, may greatly vary from one national/regional setting to the other. Recognizing and discussing these differences between various positions brings us closer not only to better understanding of ways in which heritage is shaped, but also to negotiating operational and effective models of participatory governance and actions.

16 DISCUSSION

Author: Popa, Catalin - Leiden University (Presenting author)
Co-Author: Bonacchi, Chiara - University College London; Hingley, Richard - Durham University; Babic, Stasa - Filozofski fakultet Beograd
Keywords: Future, research, agenda
Presentation Preference: Oral

We will use this time to discuss the approaches and findings adopted by presenters and scope the potential for a future research agenda on the theme of contemporary heritages of longue durée pasts in Europe.

293 MIND THE GAP 2.0! BUILDING BRIDGES BETWEEN SCIENCE, HERITAGE AND SOCIETY IN THE ARCHAEOLOGY OF ROCK ART.

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Domingo Sanz, Ines (Spain) - ICREA (Institució Catalana de Recerca i Estudis Avançats); University of Barcelona, Secció Prehistoria i Arqueologia, SERP
Co-Author(s): Gallinaro, Marina (Italy) - Dipartimento di Scienze dell'Antichità, University of Rome;
DISSUF, University of SassariFiore, Danae (Argentina) - CONICET – AIA – UBA.
Keywords: Rock art, public archaeology, collaborative-archaeology
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Rock art is an archaeological remain with scientific values. But it is also a patrimonial legacy with historical, aesthetic and cultural values of general public interest. Scientific and Heritage values have long attracted different stakeholders (researchers, Archaeology and Heritage consultants, Administrations, landowners, tourists operators and society) who have mostly worked independently to meet their particular expectations and needs. But both scientific research and Heritage interventions do impact on each other, thus urging us to find common understandings and meeting points to develop collaborative projects to bridge the gap between Science, Heritage and Society.
This session invites papers dealing with new ways of bridging the gap between Science, Heritage and Society in the archaeology of rock art. We aim to open a platform for discussing:

- How can Archaeological knowledge and products contribute to stimulate social interest and sustainable uses of this artistic Heritage?
- But more importantly, how can the different stakeholders (including local communities) be involved in developing research questions, preservation and use policies, and so forth.

Following a previous session held at WAC-8 (Kyoto, Japan) this session aims to go beyond more traditional studies of past and present forms of art to focus on how to engage the different stakeholders in the study, preservation, current use and interpretation of this particular type of cultural heritage.

01 WHAT DOES 'DECOLONISED' COLLABORATIVE INDIGENOUS ARCHAEOLOGICAL PRACTICE LOOK LIKE? EXAMPLES FROM ARNHEM LAND AUSTRALIA

Author: Jones, Tristen - Archaeology and Natural History, The Australian National University (Presenting author)
Co-Author: Rangers, Njanjma - Djabulukgu Association Incorporated, Jabiru Northern Territory Australia
Keywords: indigenous, postcolonial, collaborations
Presentation Preference: Oral

For decades there has been much debate in the academic literature regarding the role of archaeology in the postcolonial world, considering the disciplines dark colonial history. Post colonial indigenous archaeologists such as Sonya Atalay have argued that the way forward for contemporary archaeological practice is to "explore ways to create an ethical and socially just practice of archaeological research – one that is in synch with and contributes to the goals, aims, hopes and curiosities of the communities whose past and heritage are under study, using methods and practices that are harmonious with their own worldviews, traditional knowledges and lifeways" (Atalay 2006: 284). But what does this sort of archaeological practice actually look like? What are the limitations, if any, of these kind of research methods?
In this paper I present a number of research project case studies from ongoing archaeological and rock art collaborations between academic researchers, indigenous ranger groups and cultural heritage management consultancies from western Arnhem Land Australia. The research questions are borne not just from consultations with Traditional Owners but the ideas of the indigenous groups themselves, with the research questions serving cultural, social and economic functions beyond the realm of scientific research.

02 HERITAGE, SCIENCE, SOCIETY AND HISTORY PLACES IN NORTHWEST ARNHEM LAND, AUSTRALIA

Author: Professor Tacon, Paul - Griffith University (Presenting author)
Keywords: rock-art, heritage, Australia
Presentation Preference: Oral

In this paper a long term north Australian project called 'History Places' is summarised in relation to this session's objectives. Research, involves fieldwork between Traditional Owners and archaeologists to locate and record previously undocumented rock art sites in order to answer varied research questions, to develop a database for conservation and management purposes and to enhance an emerging sustainable cultural heritage tourism business driven by the Traditional Owners of the Namunidjbuk Estate, Wellington Range, northwest Arnhem Land, Australia. To date, hundreds of rock art sites have been documented. Senior Traditional Aboriginal Owner Ronald Lamilami not only supports intensive heritage research across the Namunidjbuk Estate but also is in the process of setting up a research and interpretation centre with family and clan members at Waminari Bay where they have established the Wilam camp ground. Lamilami refers to rock art sites as 'history books' and big complexes such as Djulirri (with over 3000 paintings) as 'libraries' that record all the experiences and encounters his ancestors had over time. A key research objective is to better understand chronological change in Wellington Range rock art and to record the contemporary cultural significance of rock art history places. Fieldwork undertaken in 2016 and 2017 is summarised and key issues raised by Indigenous team members are identified. For instance, Traditional Owners told us the best way to look after rock art from their perspective is through fire management, feral animal culling, vegetation monitoring and managing access. But at the same time they are interested in 3D records and using science both to better understand and to better conserve their rock art.

03 SAME MATTER AND THREE DISCOURSES: ROCK ART AND COLLABORATIVE ARCHAEOLOGY IN SEMIARID NORTH OF CHILE

Author: Cordero, Rosario - Universitat Autònoma de Barcelona, PhD Programme; Fondecyt 1150776 (Presenting author)
Co-Author: Salatino, Patricia - Universidad de Buenos Aires, PhD candidate; Fondecyt 1150776; Artigas, Diego - Universidad SEK; Fondecyt 1150776; Dr. Troncoso, Andrés - Universidad de Chile; Fondecyt 1150776
Keywords: Semiarid-north, Rock-art, Collaborative-archaeology
Presentation Preference: Oral

This work discusses how different discourses are related in rock art research at the semiarid North of Chile. These have developed a collaborative archaeology, which recognizes the multiplicity of these discourses, understanding each one in its own particularity.
We start from the premise that rock art is understood as a living matter, which acts in social contexts in an independent way from the origin of the communities that are directly linked to this kind of manifestations. Then, rock art and its implications at local heritage management can be related to three different kind of discourses:
Firstly, a scientific discourse, which is positioned within the framework of our research project. It searches to reconstruct societies in pre-Hispanic times related with past landscapes.
Secondly, a state and institutional discourse represented by the National Monuments Council of Chile (Consejo de Monumentos Nacionales), which regulates the management of archaeological sites.
And thirdly, the local community, which is non-indigenous, but nevertheless is associated to rock art in order to organize its space which has been related to its protection and care.

04 DIGGING ROCK ART FROM BOOKS. A COMPARATIVE STUDY OF EDUCATIONAL CONTENTS IN SCHOOL TEXTBOOKS AND PUBLIC SCIENCE BOOKS FROM ARGENTINA-(1910-2015).

Author: Dr Fiore, Danae - CONICET (Presenting author)
Co-Author: Lic Acevedo, Agustin - CONICET-IMICIHU
Keywords: rock-art Argentina books
Presentation Preference: Oral

This paper presents a comparative study of the rock art contents of 26 school textbooks and 16 public science books published/available in Argentina (1910–2015). We analyse which kinds of data, concepts, values and methods are contained in these books in order to assess how these may have partly shaped the public's knowledge, perception and value of rock art in Argentina. Results show a diachronic predominance of interpretive concepts (e.g. symbolism, sympathetic magic, etc.), and a recent addition of new concepts (e.g. information communication, cultural heritage, etc.), while scientific methods are only mentioned in some of the latest publications. Examples vary according to the origin of the publications: textbooks –published in Argentina– combine European Paleolithic and Argentinean sites and images, while public science books –usually published abroad– mostly focus on the former. Thus, while school teachers and students have access to a comparatively wider variety of cases –including Argentinean sites– the general public is offered a more restricted and foreign set of cases, which do not help to build knowledge about the local rock art heritage.

05 INTERNATIONAL COOPERATION, HUMAN EVOLUTION AND ROCK ART IN MEXICO

Author: Ms Sanz, Nuria - UNESCO (Presenting author)
Keywords: International Cooperation, RockArt
Presentation Preference: Oral

The presentation will look at the UNESCO thematic programme, Human Evolution: Adaptations, Dispersals and Social Developments (HEADS), coordinated by the UNESCO Office in Mexico, and UNESCO's role in international cooperation in the area of prehistory.
The HEADS programme deals with human evolution related properties that represent a process of evolutionary accretion that took place over a vast period of time, offering vital insight to scientific, cultural, ethological and historical dimensions of human development, and the earliest evidence of human ritual, expression and practice.
The development of the HEADS Programme is directed towards defining and establishing a solid strategy of cooperation and implementation to ensure the future recognition, conservation and study of these early vulnerable sites in relation to World Heritage.
Within this framework, this presentation will focus on the Rock Art World Archive, a pilot project being developed and carried out in Mexico. The project will implement a digital platform, which will be implemented by 32 Mexican states and will be led by the UNESCO Office in Mexico, in collaboration with the national and academic institutions responsible for the preservation of rock art heritage in Mexico.

06 LEVANTINE ROCK ART IN THE CONTEMPORARY WORLD: BENEFITING FROM KNOWLEDGE TRANSFER.

Author: Prof. Domingo Sanz, Ines - ICREA; University of Barcelona / SERP (Presenting author)
Co-Author: Dr. Roman, Didac - University of Barcelona/SERP
Keywords: Public archaeology,
Presentation Preference: Oral

With this presentation our aim is to go beyond traditional scientific approaches to the archaeology of rock art to explore the contemporary values of this sample of World Heritage, as well as how knowledge transfer partnership benefits the different stakeholders with interests in this millenary legacy (academics, administrations, archaeology consultants, cultural Heritage managers, tourist operators, land owners and the public).
Our thoughts build upon previous experiences developing collaborative projects with different stakeholders to stimulate social interest and sustainable uses of this artistic Heritage.

07 AFRICAN ROCK ART AS A RESOURCE FOR WHICH STAKEHOLDERS?

Author: Dr. Gallinaro, Marina - University of Rome La Sapienza (Presenting author)
Keywords: Africa, Research, Society
Presentation Preference: Oral

Africa hosts an impressive presence of rock art, widespread all over the continent. Paintings and engravings different in shape, subjects, technique and age represent an extraordinary archive of the past living societies. In a recent work Benjamin Smith (2013) estimated around 50,000 the rock art sites formally recorded by universities, museums and heritage agencies, a figure that may represents as little as 10 per cent of the actual number of sites. Up to now 11 African UNESCO World Heritage sites include rock art, and any other continent shows a similar figure. But how many of these sites are properly known and managed and who are the main stakeholders?
Aim of this presentation is to trace the main paths that have been followed in different African contexts to build bridges between the rock art stakeholders, both inside and outside the continent. This balance shows traits that require careful evaluation. Several case studies (mainly from Sahara, East and South Africa) will be presented in order to discuss the main strategies adopted and possibly to isolate the best practices to mind and fill the existing gaps.

295 LONG-TERM TRAJECTORIES OF THE REGIONAL SETTLEMENT SYSTEMS: CHALLENGES WHEN DEALING WITH COMPARISON AND COMPLEXITY

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Nuninger, Laure (France) - CNRS; Univ. Bourgogne Franche-Comté
Co-Author(s): Verhagen, Philip (Netherlands) - Vrije Universiteit AmsterdamBevan, Andrew (United Kingdom) - University College London
Keywords: settlement, landscape, spatial modelling, interregional
Presentation Preference: Round table

Over the last 10 years, several authors have produced reviews of regional settlement system studies in archaeology (Galaty 2005, Kantner 2008, Kowalewski 2008, Peterson and Drennan 2012, Feinman 2015). They all point out the major methodological and theoretical advances made in the last two decades. Many regional datasets were created and completed, allowing for quantitative and spatial analysis of settlement patterns from a landscape perspective. They also outline the importance of cross-comparison to investigate large-scale patterns, and to contribute to questions of long-term social, environmental, economical and political change.
However, the challenge remains to apply a global, comparative approach to regional settings, especially when comparing across national borders. In particular, there is a tension between two contrary perspectives: understanding human experience and contingency on the one hand, and studying trends and similarities in settlement system trajectories on the other. The first one relies mostly on simulation modelling and complexity theory, while the second one is more based on ´traditional´ quantitative methods and spatial analysis, promoting analytical simplicity. To understand regional trajectories within a multiscalar context, however, both approaches appear fundamental.
In this round-table we want to evaluate and discuss current approaches to comparative inter-regional analysis in various European countries. How can we exploit existing datasets, stemming from different scientific and heritage management traditions, for cross-border studies? How to develop common procedures for diachronic analysis, applicable to both large-scale questions and regional settings? How to build a bridge between different theoretical and conceptual frameworks?

297 ARCHAEOLOGY IN A CHANGING CLIMATE

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Stancioff, Charlotte Eloise (Bulgaria) - Leiden University
Co-Author(s): Hofman, Corinne (Netherlands) - Leiden UnviersityRiede, Felix (Denmark) - Aarhus UniversityBiehl, Peter (United States) - Buffalo UniversityMcGovern, Thomas (United States) - Hunter College
Keywords: climate, archaeology/heritage, natural degradation, transdiscipline
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Few reject the notion that climate is impacting societies and politics. Even, though archaeologists contribute much to the topics of environmental impacts and climate-driven societal change, this knowledge rarely comes to public domain. Whilst programmatic initiatives such as van de Noort's (2013) 'climate change archaeology' made progress towards such an engagement, archaeology stil tends to focus on heritage sites facing environmental threat. Little attention is given to the role of archaeology in producing evidence-based data on climate change. Archaeology explores the interpretations of history, economy, politics, and environment within the past to understand how human societies adapted – or failed to do so. Why not harness this knowledge to engage in the current global climate change debate? Inspired in part by efforts of the SAA's Climate Change Strategies and Archaeological Resources Committee and in part by movements in sister disciplines such as geology (see www.geoethics.org), this session seeks to bridge this gap by exploring trans-disciplinary examples of engaging with climate change from research design to outreach in museums and the public domain. How does archaeological work relate to political agendas; Should archaeology as a discipline take a stance on this matter? With green policies under severe pressure in Europe and elsewhere, this session explores how archaeological knowledge can be 'useable'. We seek papers reporting on novel public/policy interface perspectives, those dealing with environmental ethical dimensions of archaeological and museum practice, the archaeology of marginalized groups and climate justice, as well as papers addressing landscape and climate change in the past.

01 RADIOCARBON DATING UNCERTAINTY SEVERELY UNDERMINES OUR ABILITY TO IDENTIFY CYCLES IN PALAEOCLIMATE DATA

Author: Professor Collard, Mark - Department of Archaeology, Simon Fraser University
Co-Author: Mr. Carleton, William - Simon Fraser University (Presenting author); Professor Campbell, David - Department of Statistics, Simon Fraser University
Keywords: Time-Series, Chronology, Cycles
Presentation Preference: Oral

For archaeology to contribute to modern climate change debates, we need to build accurate models of long-term human-environment interaction that account for both cyclic and acyclic climate dynamics. Thus, it is crucial that we are able to identify cyclical patterns in palaeoclimate proxy records and distinguish those patterns from acyclic trends. However, securely identifying cycles in palaeoclimate records is challenging, especially when they are dated with radiocarbon, which is the most common chronometric method. This is because radiocarbon dates have highly irregular uncertainties that can create challenges for the standard statistical methods used to identify cycles in time-series data. In this paper, we present the results of a large simulation study in which we explored the impact of radiocarbon dating uncertainty on our ability to identify cycles in time-series records dated with radiocarbon. We conducted a series of simulation experiments involving thousands of artificial time-series with known cyclical patterns. We found that, at best, we could correctly identify cycles only 42% of the time. We also found that the rate of false positive findings can be as high as 90%. Together these findings raise significant concerns about the reliability of previous research and our ability to ever convincingly identify cycles in radiocarbon dated time-series. Consequently, for archaeology to make significant contributions to the modern climate change debate, we need to re-evaluate previous research and focus on overcoming the limitations of radiocarbon dating uncertainty.

02 COLUMBUS' FOOTPRINT IN HISPANIOLA: EUROPEAN IMPACTS ON THE LANDSCAPE OF THE CIBAO VALLEY, NORTHERN DOMINICAN REPUBLIC

Author: RMA Castilla Beltrán, Alvaro - Leiden University; University of Amsterdam (UvA) (Presenting author)
Co-Author: Prof. Hooghiemstra, Henry - University of Amsterdam (UvA); Prof. Van Geel, Bas - University of Amsterdam (UvA); Dr. Prins, Maarten - Vrije Universiteit Amsterdam (VU); Dr. Pagán Jiménez, Jaime - Leiden University; Dr. McMychael, Chrystal - University of Amsterdam (UvA); Dr. Gosling, Will - University of Amsterdam (UvA); Prof. L. P. Hoogland, Menno - Leiden University; Prof. L. Hofman, Corinne - Leiden University
Keywords: Caribbean Landscape Paleoecology
Presentation Preference: Oral

The transition from pre-colonial to colonial landscapes in Hispaniola is studied by archaeologists and palaeoecologists unveiling anthropogenic impacts on past environments. A 240-cm long radiocarbon-dated core extracted from the Biajaca sediment-filled meander (central Cibao Valley) shows on the basis of various proxies a history of landscape change during the last 1000 years. Analyses of fossil pollen and fern and fungal spores show a transition from an open marshy environment to an increasingly cultivated landscape including crop cultivation (pollen of cereals, mais, tobacco) and cattle grazing (coprophilous fungi). Records of grain size distribution (GSD) and total organic content (TOC) show the meander changed from being part of the drainage system (accumulation of coarse grains sediments) during the period of European contact to an isolated water body (accumulation of organic rich clays and aquatic plants). Temporal relationships between climatic droughts, vegetation change and fire history are based on the records calcium carbonate content, phytoliths and charcoal, respectively. An integration of all records of environmental change shows the impact of European colonization starting a few decades after Columbus' arrival. A combination with archaeological records and written history of the Cibao Valley provides an understanding of the processes that led to the increasing environmental degradation in this river valley. Local and national institutions may develop with this evidence ecological conservation agendas linked to archaeological heritage initiatives.

03 RESILIENT PAST CARIBBEAN COMMUNITIES: USING THE ARCHAEOLOGICAL RECORD TO INVESTIGATE ADAPTABILITY AND HERITAGE PRESERVATION IN THE CARIBBEAN

Author: Stancioff, Charlotte - Leiden University
Co-Author: Prof/Dr. Hofman, Corinne - Leiden University (Presenting author)
Keywords: resilience, past communities
Presentation Preference: Oral

Caribbean islands are often at the center of the vulnerability debate as current climatic trends predict elevated sea levels and increased frequency of storms, leading to significant challenges for local communities. However, Caribbean communities have been exposed to climatic challenges ever since the occupation of the archipelago 8000 years ago. Paleoclimatic records show significant climatic changes throughout the mid to late Holocene in which centuries-long cycles of dramatically wet, stormy conditions interspersed with

drier conditions and sea-level rise. Caribbean island communities, specifically those located on the low limestone islands, have therefore continually been confronted with severe droughts, tropic storms, hurricanes, tsunamis, sea level fluctuations and of course accompanying associated impacts. These varying phenomena stimulated the first inhabitants of the insular Caribbean to respond, anticipate and adapt their lifestyle as well as their socio-cultural and political structure across the region over time. Archaeological research has shown that climatic threats in the past often coincided with an emergence of resilient communities. In this presentation, we will first review a number of cases in which there is evidence of catastrophic natural events in the archaeological record and the associated adaptive responses of the first island inhabitants to such events. Second, we will focus on the contemporary climatic threats to the archaeological record by highlighting rescue archaeology projects in which collaboration between local stakeholders, governments, private institutions or foundations, and local communities from diverse geopolitical settings came together to help minimize the loss of the indigenous past. Finally, we examine what do current climatic trends mean for the historic and archaeological record in the region. We address current and future challenges of climate associated impacts on heritage by highlighting the resilience of past communities in today's current Caribbean societies.

04 ARCHAEOLOGY, POLICY AND ENVIRONMENT: AN EIS ON THE EFFECTS OF "DRAINING THE SWAMP"

Author: Walsh, Matthew - Aarhus University (Presenting author)
Keywords: Arctic, Environmental, Legislation
Presentation Preference: Oral

There is an alarmingly widening gap between current climate change and environmental policy in the U.S., and the relationship between those policies and archaeology has perhaps never been more tenuous. At the interface between climate policy and cultural resource/heritage management, (not to mention indigenous peoples' rights and issues of environmental justice) archaeology is in a pivotal position to offer insights into how past peoples coped with dramatic changes to their environments. A region that still has much to offer archaeologically, and that is of particular concern regarding the effects of climate change, is the Arctic. In the North American Arctic, coastal erosion is being increased by precipitation and permafrost thaw, amplified severity and frequency of storms, and changes in the conditions of glaciers and land-fast ice – all directly linked to the effects of global climate change. Combined, the detrimental effects of these and other conditions threaten to literally erase the archaeology of Arctic coastlines before the end of the next decade. Paradoxically, effects of environmental change in the Arctic promise to forever erase our ability to study how past peoples dealt with environmental change in the Arctic. Ironically, U.S. climate and environmental policies – rather than developing strategies for mitigating these issues – are currently actively being dismantled, promising a "double blow" to Arctic coastal archaeology. This will likely have further, far-reaching repercussions on cultural heritage legislation in the E.U. and abroad. Particularly, what are the potential effects of recent U.S. policy aimed at undoing legislations in place to protect cultural and environmental heritage under the National Environmental Protection Act (NEPA) and similar legislations, and what effects might these decisions have on similar proposed legislation in the EU under the Environmental Impact Assessment Directive and country-specific regulations in light of dwindling U.S. conventions on climate change and heritage management?

05 TOO COLD- TOO HOT. TOO DRY- TOO HUMID. CROP YIELD IN A CHANGING ENVIRONMENT.

Author: Dr. phil. Mayer, Christian - Bundesdenkmalamt (Presenting author)
Keywords: climate_change, historical_farming, quantification
Presentation Preference: Oral

Research into (pre)historic farming is traditionally tied to the fertility rating of soils as contained in soil maps. This widely used approach appears unsatisfying since it does not include a sound information about actual crop yield, the actual parameter of success of any agricultural- orientated civilization. Which is more the influence of temperature and precipitation on subsistance cannot be studied.

The contribution to the conference will introduce an alternative approach to investigate into (pre) historic farming which uses data on actual crop yield from Austria collected in the 30ies of the 20th century. This data set comprises among others information on the main arable crops like wheat, rye or barley. The data used also includes information on farming technology like machinery, size of farmsteads and the social structure of farmers. From this data spatial trends are estimated and correlation with the respective spatial trends of temperature and precipitation will be presented. Using these results an estimation of the impact of the 'Little Ice Age' on crop yield and the development of settlements structures of the 13th to the early 16th century will be given based on recent proxies of climatic parameters.

The presentation to the conference also comprises an account of the data used, the statistical methods and computer programs.

06 AN ARCHAEOLOGY OF ADAPTATION: UNCOVERING EMERGENT VULNERABILITIES FROM THE PAST.

Author: Mr Jackson, Rowan - University of Edinburgh; Aarhus University (Presenting author)
Co-Author: Dr. Riede, Felix - Aarhus University; Prof. Dugmore, Andrew - University of Edinburgh
Keywords: Vulnerability, Adaptation, Greenland
Presentation Preference: Oral

This paper focuses on the application of palaeo-societal research to contemporary climate change adaptation, with emphasis on the social transformation frameworks that have come to prominence over the past 5 years. It is recognised that fundamental social and technical change will be required to build resilient societies now and in the near future. This necessitates radical social change to reduce society's exposure to the negative outcomes of climate change. Social scientific studies have been particularly influential at identifying cultural and cognitive barriers to transformation and call for a greater intensity and duration of change. But for societies to avoid long-term vulnerability, created by environmental, economic, political and social changes, more clarity is required to identify the evolution of adaptation to better understand the challenge of transformation, which currently lacks empirical grounding. As this paper will argue, long-term social-ecological system dynamics, identifiable in palaeo-societal and environmental records, offer 'natural' and 'complete experiments' from which we might explore the dynamics of adaptation and transformation in more detail. Identifying how different cultures were (or were not) able to adapt behaviours to prevailing environmental, economic and socio-political changes, operating across multiple scales, provides essential and much needed information on the adaptive challenges we face today. Using examples from Norse Greenland, we illustrate the potential of archaeological data to engage with contemporary research focused on contemporary climate challenges. Introducing longevity to contemporary adaptation research could provide essential lessons on the risk of emergent vulnerability, resulting from complex interactions and feedbacks between adaptive strategies and changing exogenous variables (i.e. climate and social-economic change). Behaviour, adaptive under previous ecological regimes, can become unsustainable given changing selective pressures from the environment (i.e. resource systems become less productive and predictable). We conclude by advocating a greater engagement of archaeology and historical disciplines in interdisciplinary journals cited in IPCC reports.

07 KEYNOTE: WHO IS AFRAID OF CLIMATE CHANGE?

Author: Professor Doctor Van de Noort, Robert - University of Reading (Presenting author)
Keywords: climate change, theory
Presentation Preference: Oral

The investigation of the impact of climate change on communities in the past is a long-standing practice in archaeology. Nonetheless, many archaeologists appear to have, at best, an awkward relationship with modern climate change. This stands in shrill contrast with researchers from related disciplines, geographers and ecologists prominently among them, who have made modern climate change studies their own.

Why are archaeologists afraid of using their knowledge of the past and skills to address modern climate change and its impact on communities head-on? This paper sets out two things:

1. it will explore the reasons behind this reluctance to play an active art in climate change debates;
2. it offers some novel methods and tools to help archaeologists become active in modern climate change debates.

08 LEARNING FROM ANCIENT WATER MANAGEMENT: ARCHAEOLOGY'S ROLE IN MODERN CLIMATE CHANGE ADAPTATIONS

Author: Dr. Kaptijn, Eva - Royal Belgian Institute of Natural Sciences (Presenting author)
Keywords: water management, adaptation
Presentation Preference: Oral

Climate change is one of the most pressing matters our society has to deal with in the coming decades. The effects of climate change are obvious throughout the world with aridification being one of the most pressing and noticeable consequences. Archaeology is largely absent from discussions on the impact of modern climate change on society (e.g. IPCC 2015). This is unjustified. Archaeology's long-term perspective can offer valuable insights into the adaptive pathways of past human communities to changing climate and environments and the feedbacks that ensued. While other disciplines study truncated developments, because the ending lies in the future, archaeology can monitor effects over long periods of time.

However, the realisation and wish that archaeology can provide a valuable contribution to the climate change debate has sometimes resulted in exaggerated claims. Archaeologists should be critical about the discipline's potential to mitigate the effects of modern climate change. There are clear problems in the reconstruction of ancient adaptive strategies as well as their translation to the present.

This does not mean that research into ancient irrigating societies has no role to play in discussions on modern climate change and resilience. Archaeological knowledge on ancient responses to water deficiency is not a panacea to all modern climate change related aridification, but it can provide effective remedies in specific circumstances.

This paper will investigate the role that ancient water management can play in efforts to mitigate the effects of modern climate change. The focus will lie on exploring the potential as well as the problems of using archaeological knowledge in modern climate adaptation strategies, while discussing specific case studies where ancient water management has been employed in modern situations.

09 CLIMATE HISTORY/CULTURE HISTORY. ADDING VALUE THROUGH COUPLED NATURAL AND CULTURAL HERITAGE IN THE CONTEXT OF A LARGE MUNICIPAL ADAPTATION PROJECT

Author: Dr Riede, Felix - Aarhus University (Presenting author)
Keywords: climate, heritage, adaptation
Presentation Preference: Oral

In 2017, the EU Life-funded Coast 2 Coast Climate Challenge (C2C CC: http://www.c2ccc.eu/) project was initiated. This project aims to support and enhance individual municipal council plans for climate change adaptation by integrating them at a region-wide scale. One sub-project within C2C CC is concerned with coupling climate history and culture history in that same region, and aims to provide a historically informed and evidence-based dissemination platform for C2C Climate Challenge that facilitates citizen-near adaptation and long-term behavioural change. The sub-project couples existing environmental and cultural historical datasets together in order to provide evidence-based snapshots of past environmental conditions and human responses. With a focus on hydrological changes in inland (river, lake) and coastal contexts, it connects directly with other C2C CC sub-projects and makes use of existing dissemination platforms – museums primarily – in order to showcase the overall project nationally and internationally. Finally, the project will add value to C2C CC overall by translating climate history into components useable also in sustainable heritage management and growth via tourism.

10 KEYNOTE: HOW TO PUT THE PAST INTO CLIMATE CHANGE POLICY AND RESPONSE: A VIEW FROM THE US FEDERAL GOVERNMENT

Author: Dr Rockman, Marcy - US National Park Service (Presenting author)
Keywords: climate change, policy
Presentation Preference: Oral

I once heard a Native American tribal member reply to a question about climate change impacts on his community that he couldn't identify specifically what those impacts would be because there were so many other effects of modern development happening right now. Questions of how to integrate archaeology with climate change policy require a similar response. There are two types of climate change policy for archaeology and other forms of cultural heritage: policy to understand and manage the effects of climate change on heritage, and climate policy informed by archaeology and heritage that can speak to the adaptation of society at large. To create and enact such policies, however, requires navigating the complexities of the policy process, how society at large manages and understands the past, how questions about climate change and response are formed and addressed, etc. Here I present accomplishments, lessons, and future hopes from work to incorporate archaeology into climate change at the US National Park Service and disaster preparedness at the Environmental Protection Agency.

11 WHAT TO DO NEXT? EARLY EXPERIENCES WITH THE MULTI-DISCIPLINARY, MULTI-NATIONAL COLLABORATIVE STORM CLIMATE AND HERITAGE PROJECT.

Author: Dr Williamson, Rob - Mellor Archaeological Trust
Co-Author: Mr Thompson, Adam - University of Salford (Presenting author)
Keywords: Climate, Heritage, Prediction
Presentation Preference: Oral

STORM: Safeguarding Cultural Heritage through Technical and Organisational Resources Management

Europe's cultural legacy is one of the richest in the world; it draws millions of people every year to our archaeological sites, buildings and museums. Its protection and conservation is a priority. Many EU heritage assets are extremely exposed to climate change and natural hazards, which threaten their integrity and may compromise their value. In the last four decades, many European institutions have carried out works on preventive strategies aimed at protecting the cultural sites with the focus directed upon the impact of climatic change on individual heritage sites, with prevention, protection and public policies at their core. Relatively few have proposed the question: What to do next?

The STORM project, an EU Horizon 2020 funded project with 20 collaborating institutions across Europe, is developing a set of novel predictive models, informed by improved non-invasive and non-destructive methods of survey and diagnosis, both historically and in real time, for the effective prediction of environmental changes and for revealing threats and conditions that may damage cultural heritage sites.

STORM usees pilot sites in five different countries: Italy, Greece, UK, Portugal and Turkey to determine how different vulnerable materials, structures and buildings are affected by different extreme weather events together with risks associated to climatic conditions or natural hazards, and offering improved, effective adaptation and mitigation strategies, systems and technologies. The resulting and perhaps the more significant impact is the development of integrated user friendly, cloud based platforms and applications that inform relevant stakeholders of the real time activity and associated threat resulting from changes in both weather and climatic conditions.

Five pilot sites, are currently:
Diocletian Baths: Italy, Mellor Heritage Sites: United Kingdom, Roman Ruins of Troia: Portugal, Rethymno historical centre: Greece and Ephesus: Turkey.

12 CITIZEN ARCHAEOLOGY AND CLIMATE CHANGE

Author: Graham, Elinor - SCAPE; University of St Andrews (Presenting author)
Co-Author: Dawson, Tom - University of St Andrews
Keywords: Erosion, Scotland, coast
Presentation Preference: Oral

The coastal zone is at the forefront of the impacts of climate change, manifesting as erosion, rising sea levels and increasing frequency and severity of storms. Scotland's rich archaeological heritage is concentrated in the coastal zone, and is therefore particularly vulnerable to the impact of climate change. In recognition of the severity of the threat, the SCAPE Trust was set up in 2000 with a remit to research, conserve and promote the heritage of Scotland's coast.
A programme of coastal survey was carried out from 1996 to 2010 and targeted 40% of the Scottish coastline. These surveys recorded both the physical nature of the coast edge and the archaeological sites along it. A desk-based prioritisation project was undertaken which highlighted 1000 sites as being both vulnerable and archaeologically significant, and emphasised the need for current condition information.
Since 2012, SCAPE has run the Scotland's Coastal Heritage at Risk Project (SCHARP) utilising a citizen science approach to capture up-to-date records of these sites. Volunteers from local communities are given training to contribute condition information, specifically targeting the most vulnerable sites. These citizen archaeologists are thus directly involved in ground truthing data on the impact of coastal processes on vulnerable archaeological sites. Local communities are therefore engaged with the issues of modern climate change.
SCAPE analysed the community-generated data and in consultation with heritage managers has created an updated set of local and national priorities. SCHARP results were also mapped against the National Coastal Change Assessment, which models the future susceptibility of the coast to erosion, and hence have helped inform future coastal management.
This paper will present SCHARP as a case study of how data generated by project volunteers has contributed to government policy, heritage management and the future management of coastal change.

13 CLIMATE CHANGE, COMMUNITIES AND COMMUNICATION: CHALLENGES AND OPPORTUNITIES IN ENGLAND

Author: Dr Fluck, Hannah - Historic England (Presenting author)
Keywords: climate change, heritage
Presentation Preference: Oral

Historic England is the public body that looks after England's heritage, advising government and working to support those who care for England's past, whether through ownership, land management or working to mitigate the impacts of development. In June 2015, in response to a commitment arising from the Climate Change Act 2008, Historic England submitted a Climate Change Adaptation Report to the UK government. Within that report Historic England committed to:
'Promote the positive role the historic environment can play in informing responses to climate change and associated environmental risks.'

Historic England intends to achieve this by supporting or undertaking research in the following areas: promoting urban green space as heritage value and role in urban heat island mitigation; promoting the 'long view' of land management impact on flood management and settlement pattern; promoting traditional building techniques for resilient construction; providing a context for coastal change.

This paper will present Historic England's progress on this commitment, and consider the challenges and opportunities encountered to date. There will be particular reference to the role of heritage in flood management and to the potential benefits and pitfalls of trying to engage with the natural environment sector through ecosystem service approaches.

Fluck, H. 2017. Historic England Climate Change Adaptation Report. Historic England Research Report Series no. 28/2016

14 HOLOCENE CLIMATE CHANGE AND HUMAN SOCIETIES. LESSONS TO LEARN FROM THE PAST?

Author: Professor Dr Hafner, Albert - University of Bern (Presenting author)
Keywords: climate-change, societies, migration
Presentation Preference: Oral

In 2016 a remarkable paper of Axel Timmermann and Tobias Friedrich in Nature linked climate, vegetation and human-dispersal models to understand how climate change may have triggered Pleistocene human migrations out of Africa. This large-scale study supports the view that climate may have been a key factor. How is the situation in the Holocene? Are there clear evidences for changes of human behaviour and/or evidences of adaptation of human societies after climatical impacts (cold events, draughts)? Is it possible to link climatical impacts with high probability to societal processes as migrations, collaps or others? Starting from selected case studies I will try to bring in some thoughts on how to enhance societal relevance of archaeological research related to past climate changes.

299 'WHAT HAS HAPPENED IN CERAMIC STUDIES SINCE BRUGGE 1997?

Theme: 6. Interpreting the archaeological record
Author: Hall, Derek (United Kingdom) - Centre for Environment, Heritage and Policy, Stirling University, Scotland
Co-Author(s): De Groote, Koen (Belgium) - Erfgoedonderzoeker Archeologie
Keywords: ceramics, Medieval Europe, training, minimum standards
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

MERC
Medieval Europe Research Community

This session will review progress, or lack of it, in medieval ceramic studies since the Medieval Europe conference in Bruges in 1997. Themes to be addressed will include the advancement and integration of scientific analysis into ceramic studies, the identification of trade patterns and contact between the countries of medieval Europe, progress on the understanding of the type and nature of local pottery production centres, minimum standards in ceramic studies and a consideration of the future for the discipline. Training to ensure that there is a continuation and availability of people with ceramic expertise is vitally important but how can this be achieved and more tellingly who should pay for it? The study of Material culture has suffered noticeably since the onset of developer funded archaeology, has ceramic studies suffered in a similar manner? This session is aimed at active medieval ceramic practitioners across Europe and the UK.

01 IS THE CUP HALF FULL? QUALITY AND STANDARDS IN POTTERY STUDIES IN BRITAIN

Author: Mr Brown, Duncan - HE - Historic England (Presenting author)
Keywords: Pottery Standards Future
Presentation Preference: Oral

Several recent initiatives in the UK have raised issues around specialist studies in archaeological pottery. In 2014 Historic England produced guidelines for pottery production sites; in 2016, the three ceramic study groups in England, the Prehistoric Ceramics Research Group, the Study Group for Roman Pottery and the Medieval Pottery Research Group, worked together to produce ' A Standard for Pottery Studies in Archaeology' (http://romanpotterystudy.org/new/wp-content/uploads/2016/06/Standard_for_Pottery_Studies_in_Archaeology.pdf); in 2017 the Special Interest Group for Finds of the Chartered Institute for Archaeologists competed a survey of over 1,000 finds reports that established measures for assessing the quality of finds reporting. All of this provides a backdrop to discussions on the future of pottery studies in the context of training, expertise and the pressures of commercialisation. This paper will present a summary of the initiatives described above and examine their significance as we try to develop the discipline. The new Standard is framed around the way archaeological projects progress from planning through data-gathering to reporting and archiving. All of those processes seem permanently to be in a state of re-examination within the current climate of cost-efficiency, while re-evaluation of planning regulations could place further limitations on the ways in which archaeological projects are completed. Pottery specialists, meanwhile, remain a varied community, with some based in academic institutions, some employed by commercial companies and others working freelance. Succession planning, co-operation and a shared sense of responsibility towards maintaining standards and developing methodologies and research questions can therefore be difficult to sustain. This paper cannot, therefore, avoid the question – where do we go from here?

02 AN INTERRUPTED PATH? RETHINKING MEDIEVAL CERAMIC STUDIES IN ITALY IN THE LAST 40 YEARS.

Author: Full-time Researcher Citter, Carlo - University of Siena (Presenting author)
Keywords: pottery, antiquary, chronologies
Presentation Preference: Oral

The study of pottery used to be one of the pillars of medieval archaeology in Italy in the '70ies and '80ies of the 20th c. Pottery was at the same time the main chronological indicator and the best preserved find, due to the available techniques of investigation. Major efforts have been made to make chronological series of different typologies. Late Roman fine wares, amphoras, glazed wares were at the centre of the interest of many research groups. Pottery studies spread in almost every region of Italy, from north to south. Virtually, it was the only topic that unified different approaches. This emphasis diminished in the '90ies and in the last two decades it almost vanished. There are several possible explanations for this sudden drop-down. The main one seems to be the emerging of new tools to get more precise chronologies. Thus, pottery became a neglected dark corner. Often, it seems to have jumped back to antiquary. Things are changing today. Again, the technological progress provided more tools to go beyond antiquary and typologies.

03 THE NETWORK ICERAMM "INFORMATION FOR MEDIEVAL AND MODERN CERAMICS" AND ITS WEBSITE DATABASE: RESULTS AND PROSPECTS 10 YEARS AFTER CREATING.

Author: Ingénieur Recherche CNRS Husi, Philippe - CNRS, UMR 7324 CITERES-LAT (Presenting author)
Keywords: Ceramic, Network, Database
Presentation Preference: Oral

The ICERAMM network, created ten years ago, brings together a majority of pottery researchers or members interested in this field, mainly from French-speaking Europe. Each year in a different European city a two days seminar is organized to allow researchers to meet, exchange and discuss. The network includes a website with a geolocalized database that allows a dynamic construction of typological tools, hierarchized on a regional scale (repertory and references of vessel forms and fabrics), but also typological information about ceramic assemblages per site. The ICERAMM website is an instrument to harmonize the methods of ceramic analysis. It is an essential way to make intra-regional comparison of ceramic assemblages possible, but also on supra-regional scale to answer questions of exchange in the long run and on a large geographical scale, like Northwest Europe. This communication will be an opportunity to present the main functionalities of the site, but also the profile of users and how they have appropriated this virtual tool, the use they make of it, notably in the context of excavation reports and publications. The objective of this communication is also to present the perspectives of the network in the future years. An ICERAMM presentation at the EAA is also the occasion for a broader discussion, an opportunity, of possible links with other European networks in this field. (ICERAMM: http://iceramm.univ-tours.fr)

04 TOO MUCH TRUFFLING? RETURNING TO THE BIG PICTURE IN MEDIEVAL CERAMIC STUDIES

Author: Dr Jervis, Ben - Cardiff University, School of History, Archaeology and Religion (Presenting author)
Keywords: pottery, medieval, economy
Presentation Preference: Oral

Emmanuel Le Roy Laudrie once observed that there are two types of historians; truffle hunters who root around for treasures and never look up, and parachutists, who view the past from above, able to see the big picture. Of course, successful history or archaeology requires both approaches - but have ceramicists been too concerned with truffling and could we benefit from jumping out of a plane every once in a while?

The years since MERC Brugge have led to massive advances in our knowledge of pottery. Long standing backlog projects have come to publication, large quantities of pottery are studied thanks to the explosion of commercial archaeology, quantitative methodologies have expanded across Europe and scientific advances mean that we are now able to characterise ceramics with greater precision than ever before. This research is vital to developing out knowledge of medieval pottery, however, for all of this 'truffling', ceramics have failed to feature prominently in the discipline of medieval archaeology as a whole - have we failed to use pottery to understand medieval society?

This paper will review how ceramic studies have contributed to the development of broader themes in medieval archaeology, such as the study of identity and economy, and explore ways in which ceramic studies might become more central to the discipline. In doing so, it will be proposed that whilst we must keep on 'truffling', if we are to contribute to the study of medieval society we must occasionally look down from above.

05 CHARACTERIZATION OF CERAMIC SHERDS FROM BULGARIA IN TERMS OF FIRING TEMPERATURES DETERMINED BY ROCK-MAGNETIC STUDIES

Author: Dr Kostadinova-Avramova, Maria - National Institute of Geophysics Geodesy and Geography, BAS (Presenting author)
Co-Author: Prof Jordanova, Daniela (Neli) - National Institute of Geophysics Geodesy and Geography, BAS; Prof Jordanova, Diana - National Institute of Geophysics Geodesy and Geography, BAS; Dr Grigorov, Valeri - National Archaeological Institute with Museum, BAS; Dr Lesigyarski, Deyan - National Institute of Geophysics Geodesy and Geography, BAS; Dr Dimitrov, Petar - National Archaeological Institute with Museum, BAS; Dr Bozhinova, Elena - Regional Archaeological Museum in Plovdiv, Bulgaria
Keywords: ceramics, temperatures, rock-magnetic
Presentation Preference: Poster

Ceramic sherds are the most common findings at archaeological excavations. They are a valuable source of information about the culture, traditions and manufacturing tendencies of the ancient communities. It was proven that interdisciplinary approaches are of great help for the reconstruction of the past firing technologies. The main thermal characteristics are duration of the fire process, maximum firing temperature, heating rate, soaking time and firing atmosphere. The most common methods applied for the firing temperature determinations are indirect, have low level of precision and are applicable only over a limited temperature range. In this aspect, methods based on the magnetic properties of ancient ceramics seem to be much more promising and successful.
In the present study, maximum firing temperatures were determined for a large collection of archaeological sherds using magnetic susceptibility measurements. The chosen samples were carefully selected to include a great variability set according to chronology, size, wall thickness, colour, internal structure, production style, type of technological production, purpose of usage. They are coming from three representative for Bulgaria archaeological sites – Pliska, Veliki Preslav and Plovdiv spanning a period of Bronze Age to Middle Ages. The obtained results point out, that maximum firing temperatures varied in different ranges for the studied sites: Pliska – from 710 to 890 oC, Preslav – from 730 to 950 oC and Plovdiv - from 590 to 930 oC. For the Bronze Age ceramics firing temperatures of 730-750 oC are identified, while for the Roman period and Middle Ages maximum firing temperatures often reach 830-950 oC. The performed investigation confirms that the application of rock-magnetic methods for the characterization of ceramics production is capable to complement considerably the archaeological knowledge of pottery firing technology.

06 EARLY MODERN CERAMICS IN FLANDERS (BELGIUM): PAIN OR PLEASURE?

Author: Dr. Poulain, Maxime - Ghent University; SOLVA (Presenting author)
Keywords: Ceramics, early-modern, Belgium
Presentation Preference: Oral

Already in the late 1980s, Frans Verhaeghe stated that there was a great need for systematic and detailed analysis of early modern ceramics in the Low Countries. Now, almost thirty years later, his analysis remains relevant. What are the reasons behind this status quo? And how can we move forward? In the current developer funded archaeology, with the sole emphasis all too often on structural features, a renewed balance is desirable in which early modern artefacts are also gathered and studied. Drawing on case studies from Flanders, I will present some methods to deal with the generally large assemblages of pottery. The case studies furthermore illustrate the potential of ceramic studies in contributing to the debate on socio-cultural transformations in early modern Europe. The inherent interdisciplinarity, combining traditional archaeological techniques with scientific

analysis and the study of documentary sources, finally serves as the most valuable asset of the discipline. It forms the basis to increase its popularity among people of different ages and interests.

07 POTTERY RESEARCH IN FLANDERS: A BALANCE OF THE PAST 20 YEARS

Author: Dr. De Groote, Koen - Flanders Heritage Agency (Presenting author)
Keywords: medieval pottery studies
Presentation Preference: Oral

After the legislation of archaeology in 1993 and the implementation of the Malta Convention (Valetta Treaty), a strong evolution occurred in the way archaeology is organized and financed in Flanders. This change resulted in a multiplying amount of excavations, and of actors, especially since private contractors entered the 'archaeology market' in 2002. But did the study and knowledge of medieval and post medieval pottery evolve in the same way, together with the large amount of new data that came to light? What are the results, what kind of knowledge is gathered, what are the black holes and how are they dealt with? But it is also important to evaluate the level to which the advancing knowledge of the last 20 years is being used by fieldworkers. Are the results visible in archaeological reports and publications? Are there many new publications after all?
It's time to make a balance of the last 20 years and to look forward.

08 THE FABRIC OF OUR BEING? SCOTLAND'S MEDIEVAL CERAMICS IN THE 21ST CENTURY

Author: Mr Hall, Derek - Derek Hall, archaeologist and ceramic specialist; Stirling University (Presenting author)
Keywords: Scotland, medieval, ceramics
Presentation Preference: Oral

Medieval ceramic studies in Scotland experienced a Renaissance in the late 1990's due to considered funding and achievable project designs. 20 years on how does the subject now look in a 21st Century environment of development pressure and funding uncertainty? This paper will outline the successes of the last couple of decades which include : the marrying of scientific analysis with ceramic studies, reviewing the range of wares imported into medieval Scotland and examining the location and nature of local pottery production. It will outline areas where the author feels that work still needs to be done and consider whether the impetus for such progress still exists.

09 MINERAL PIGMENTS AND CERAMICS DECORATION: A STORY OF CONTACTS, TRANSMISSION OF KNOW-HOW AND EXCHANGES

Author: Dr. Caroscio, Marta - Ministero della Pubblica Istruzione (Presenting author)
Keywords: pottery-making, cobalt-blue, trade
Presentation Preference: Oral

This paper wishes to analyse how the research concerning mineral pigments used in pottery making – and cobalt blue more specifically – has progressed from the late 1990s to the present days. The studies on ceramics forms, the development of scientific analyses, and the combined use of written sources have permitted to reconstruct, on the one hand, the exchange of pottery as a finished product, on the other hand, the trade of raw materials involved in its making. The use of cobalt blue in tin-glazed pottery making tells us a story of trade and transmission of know-how between different areas in Europe and beyond, shedding new light on the influence of fashion in determining market demand.

10 IMPORTS AND LOCAL PRODUCTION – NEW VIEWS ON AN EXTENSIVE POTTERY COLLECTION FROM LÖDÖSE, A MEDIEVAL TOWN IN WESTERN SWEDEN.

Author: Senior Archaeologist Jeffery, Sonia - Västarvet/Lödöse Museum
Co-Author: Dr Brorsson, Torbjörn - Ceramic Studies, Sweden (Presenting author)
Keywords: Pottery, production, Sweden
Presentation Preference: Oral

The trading port of Lödöse was founded in the late 11th century and in 1473 the inhabitants were forced to leave the town and move closer present day Gothenburg. After 50 years of excavations, we know a lot about the town of Lödöse, where the churches and the monastery were situated and the location of the castle and the harbour. However, our knowledge about the inhabitants and the pottery is still limited.
In 2013 a project was started to classify the c. 50, 000 medieval pottery sherds we have in our collection. It is now the fourth year of the project and this paper aims to present some of the results so far, concerning social differences within the town, imports versus locally produced ceramics and to present clear evidence of a large pottery production in Lödöse.
A number of ICP-MA/ES analyses have been made so far, showing some interesting results which we will address. We have noticed that Scandinavian potters were greatly influenced by their fellow craftsmen in England and mainland Europe when it comes to making redware. Are we talking about imports or migratory potters or both? There is also a great number of Baltic ware and other types of black/greyware in Lödöse, which we have studied more closely to determine their origins. By using the ICP-analyses we now have clear evidence that they made unglazed as well as glazed pottery in Lödöse from at least the 12th century to the 15th century.
Today we have a new picture of the use of pottery in Lödöse. We are starting to see social and cultural differences within the town, and the variety of imported vessels show extensive trade contacts with other parts of Europe.

Torbjörn Brorsson, Ceramic Studies, Sweden
Sonia Jeffery, Lödöse museum, Sweden

11 THE EARLY MEDIEVAL CERAMICS IN FRENCH COASTAL FLANDERS : TECHNICAL AND TYPOLOGICAL ANALYSIS

Author: Ms Vincent, Vaiana - INRAP; CRAHAM - UMR 6273
Co-Author: Mr Routier, Jean-Claude - INRAP (Presenting author)
Keywords: ceramic, Early medieval
Presentation Preference: Oral

The development of rescue archaeology since the end of the nineties in France has lead to hundreds of archaeological surveys and excavations in Coastal Flanders, which represents at least 700 hectares. A considerable number of early medieval sites has been discovered this way. For the past two years, a synthetic work has been undertaken, particularly on ceramics. The study has focused on the most interesting ceramic assemblages. Binocular observations allow us to establish technical groups and recognize importations like Pingsdorf or possibly Badord, Paffrath and Verhaeghe A productions. Seriations confronted to radiocarbon dating (on bones or charcoals) helped us distinguish three phases that were previously associated, situated between the end of 8th and the beginning of the 11th century. A new look on typology completes this work and will allow future comparisons and a new interpretation of this territory.

12 POTTERY FROM SOUTHERN LOWER SAXONY AND ITS IMPACT ON THE NORWEGIAN CERAMIC SEQUENCE IN LATE MEDIEVAL AND EARLY MODERN PERIOD

Author: Mag. Demuth, Volker - Arkeologisk museum, Universitetet i Stavanger (Presenting author)
Keywords: Norway, stoneware, Weserware
Presentation Preference: Oral

As widely known, the medieval and early modern pottery from Norway is highly interesting, as it is all imported. Due to the lack of an autochthon pottery production and the close integration in the naval networks of the North and Baltic seas, ceramic finds from Norwegian towns, with Bergen as the largest and most important one, mirror major developments in Northern European pottery production. From the large amounts of pottery derived from rescue excavations in 1950 to 1990, only certain wares have been explicitly presented in a number of papers, mainly in the last decades of the 20th century. Interestingly, many of these studies were provided by researchers from the production countries, such as Great Britain, France and Germany. Also this paper will add another brick to the puzzle of the Norwegian ceramic sequence, by presenting stoneware and painted earthenware from Lower Saxony in Bergen. These technological and typological well-defined groups were hitherto not very well explored in Norway. They can give a glimpse of the late medieval and early modern use of pottery in Norway, thus giving insight in the variations on the ceramic marked from the 14th to 17th century.

13 PAFFRATH, PINGSDORF OR BREITSCHEID? – A REVIEW OF MEDIEVAL GREYWARE PRODUCTION IN THE RHINELAND

Author: M.A. Keller, Christoph - LVR - Amt für Bodendenkmalpflege im Rheinland (Presenting author)
Keywords: greyware pottery paffrath
Presentation Preference: Oral

When Walter Lung excavated several pottery kilns in the village of Paffrath, the production centre for a distinct and easily recognizable medieval greyware, with its bluish metallic sheen considered to be the most characteristic feature, was discovered. It soon became clear, that Paffrath ware, sometimes also called blue-grey ware, was widely traded down the Rhine and around the North Sea as well as the western parts of the Baltic.
Therefore most research on Paffrath ware and Rhenish greywares in a more general sense has been undertaken on trading and consumer sites in central and northern Europe.
The paper will have a look at the more than 40 pottery centres producing medieval greyware in the Rhineland. Some of them, like Pingsdorf or Meckenheim, have seen recent publication while others, like Paffrath oder Wildenrath, are known only from short contributions and some, like Bonn or Eckdorf, are almost unheard of.
The paper will give an overview of the greyware production, which started at the end of the 9th century and continued until the beginning of the 14th century. During this period a few larger and long running pottery producing centres were established, while some other workshops only worked for hardly more than a decade.
One main focus of the paper will be the question, whether all pottery produced at Paffrath really has the typical appearance attributed to „Paffrath ware". It will also look on other pottery production centres like Pingsdorf or Siegburg, where „Paffrath ware" was produced in even larger quantities.

14 THE EARLY-MODERN TOWN OF NYA LÖDÖSE - CERAMIC STUDIES WITHIN A LARGE-SCALE CONTRACT ARCHAEOLOGY PROJECT

Author: MA Gustavsson, Jeanette - Rio Göteborg Natur och Kulturkooperativ
Co-Author: MA Forsblom Ljungdahl, Veronica - Bohusläns museum (Presenting author)
Keywords: pottery, early-modern, methodology
Presentation Preference: Oral

Since 2012 there have been large excavations of the early-modern town of Nya Lödöse in present day Gothenburg. Among other finds, 20 000 shards of pottery from 16 000 vessels have been registered. Knowing that the pottery material would be extensive we strived to have a well thought-out strategy for collecting, registering and involvement of different specialists from the beginning. This included a strategy for transfer of knowledge between senior specialists and younger working together.

The registration is carried out in Intrasis which is combined GIS-software and database. Since the pottery assemblage is well stratified it is possible to study changes over time in for example contact networks as well as changes in dining habits and food consumption during the 16th century.

To gain a better understanding of the pottery material we have taken about a hundred samples for ICP-analysis, not only on our own material but also on other materials for reference. Mainly from Sweden and Scandinavia but the aim is to have more references from other European pottery assemblages as well. We have chosen to focus on glazed red earthenware and reduced earthenwares as very little is known of the production of these types of pottery during the 16th century in Scandinavia. At the same time it is usually the largest find category.

We have no archaeological traces of pottery production and there are almost no known production sites in this region during the 16th century. Neither is there any mentioning about potters among the artisans in Nya Lödöse. However, results from the ICP-analyses indicate that there might be a production site quite close to Nya Lödöse. This gives us opportunity to discuss production and contact networks on a regional level although the archaeological and written evidence are lacking.

15 THE INFLUENCE OF THE ROMAN MARKET IN THE LAZIO REGION: COMPARISON OF TWO CASE STUDIES

Author: Dr Brancazi, Beatrice - Sapienza, Università di Roma
Co-Author: Dr Graziano, Maria Stella - Sapienza, Università di Roma (Presenting author)
Keywords: Roman Pottery Trade
Presentation Preference: Oral

During the researches carried out for two doctoral thesis in Post Classical Archaeology at the University La Sapienza of Rome, has emerged the opportunity to analyse some aspects about the production and trade of pottery during Late Antiquity and Middle Age. In particular these researches focus on the influence of the Roman market in two different and strategically important areas of the Lazio region: the Late Antique Roman Ostia (IV-VII century A.D.) and the XIII-XV century A.D. phases of Leopoli-Cencelle town (Viterbo).
A common link between the two contexts of study is their relationship with the city of Rome. The "eternal city" kept a key point of exchange and trade, and had probably a directly and indirectly influence on the ceramic productions in both areas. These influences are confirmed, in addition to the written sources, by the permanence through centuries of strategic roads like, for example, the Aurelia.
The research methods, which are common for both contexts, (like, for example, the quantifications procedure) is allowing to make important consideration and comparisons for both areas in the different periods.

301 NEW TRAINING MODELS TO INNOVATE EUROPEAN ARCHAEOLOGY: THE CHALLENGE OF PUBLIC ARCHAEOLOGY

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: González-Marcén, Paloma (Spain) - Universitat Autònoma de Barcelona
Co-Author(s): Holtorf, Cornelius (Sweden) - Linneaus UniversityChowaniec, Roksana (Poland) - University of WarsawGalanidou, Nena (Greece) - University of Crete
Keywords: Public Archaeology Training European archaeology
Presentation Preference: Round table

During the last two years, Innovarch, an Erasmus+ project, conducted by four European universities (Universitat Autònoma de Barcelona, University of Crete, University of Warsaw and Linnaeus University), has experimented with new approaches aiming to introduce public archaeology training in European Higher education from a transdisciplinary approach. The contents and dynamics of four intensive courses, each of one organized by one of the partner universities and with the attendance of undergraduate, master and Ph.D. students from Spain, Greece, Poland and Sweden, have been designed as places of encounter and critical discussion with a great diversity of non academic heritage agents. The aim of this round table is not only to share the results of the project, but also to propose an in-depth discussion of some of the issues that have arisen along the project development:
(1) Has Public Archaeology to be considered a specific training and research field or public archaeological aims and procedures (i.e. trasndisciplinarity) should permeate contemporary archaeological practice as a whole?
(2) How can the strong local nature of the projects and activities in the field of European public archaeology benefit from a transnational comparative perspective, both regarding practice, research and training and viceversa?
(3) Which changes are necessary to be introduced in academic research and training organizations to create structured collaborative frameworks with non-academic colleagues, stakeholders and citizens?
(4) Which areas of expertise and practice do Public Archaeology share professionalized concept of Applied Archaeology?

302 INTEGRATING NATURAL AND CULTURAL HERITAGE: INTERNAL COHERENCE AND EXTERNAL EFFICIENCY

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Van Londen, Heleen (Netherlands) - University of Amsterdam
Co-Author(s): Felgueiras, Marcial (Portugal) - A Rocha Portugal
Keywords: interdisciplinarity, natural, cultural, heritage, sustainability,
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Many European countries have an established and maintained division between natural and cultural heritage in dealing with the landscape. It is an outcome of largely independent developments and operations in both sectors. This separation is further strengthened as a result of numerous national and international legal regulations and administrative procedures. Developments in past years made it clear that this divide is counterproductive in addressing a number of issues facing today's Europe and the world. This involves difficulties in developing common policies for sustainable development, problems in effectively addressing common threats facing both forms of heritage. As a consequence, there is a growing understanding of the advantages of an integrated approach to both domains that may bring large-scale benefits to nature and culture and help resolve different social and political conflicts. Crossing disciplinary boundaries is paramount to safeguard natural and cultural heritage.
The session discusses issues pertaining to the combined and integrated approach of cultural and natural heritage. In particular, it addresses two major forms of integration: (a) internal cooperation between these two domains, and (b) engagement of the integrated heritage with the external world. Regarding the first form, the session offers different strategies for crossovers between natural and cultural heritage overcoming this divide. It intends to scrutinise the corresponding approach to landscape management and transferring knowledge to the wider public, presenting the landscape and debating different forms of public engagement. This programme will have a follow up in the discussion session pertaing to politics.

01 INTEGRATING NATURAL AND CULTURAL HERITAGE. PRACTICAL SOLUTIONS AND EDUCATIONAL STRATEGIES FOR HERITAGE PROFESSIONALS

Author: Professor Marciniak, Arkadiusz - Adam Mickiewicz University (Presenting author)
Keywords: heritage, distance learning
Presentation Preference: Oral

The objectives of this introductory paper are twofold. Firstly, it aims to present major facets of the ongoing processes of integration of cultural and natural heritage policies and strategies. It will identify major aspects for crossovers between natural and cultural heritage by referring to overlapping domains between humans and the natural world. It will further pinpoint major integrative practices in culture and nature heritage such as human-nature relations, land use planning pertaining to aspects of landscape, societal values and governance, protecting and managing the landscape and presenting the landscape. It will also discuss the role and contribution of different stakeholders to this integrative process including heritage professionals, academics, policy makers and the public. These developments will be presented in the context of integrating heritage with regional policies as an element of sustainable development.

The debate on integrating natural and cultural processes remains largely detached from everyday life of practitioners from both sectors. The emerging solutions need to be effectively conveyed to these groups making possible their effective implementation. Hence, the second objective of the paper is to present a comprehensive mode of delivering didactic materials to these groups, which were developed in the ongoing Erasmus Plus project 'Innovative format of education and training of the integrated cultural and natural heritage' (ANHER). The paper will further present an overview of didactic materials addressing major aspects of integrative practices in culture and nature heritage produced in the project, an electronic Content Repository of didactic material in these domains as well as the Heritage Educational Portal - the largest MOOC in the domain of heritage studies.

02 NATURAL HERITAGE MANAGEMENT, OR IS IT CULTURAL HERITAGE AFTER ALL? TOWARDS NEW COMMONS AND SHARING INTERESTS IN THE LANDSCAPE.

Author: Dr. Pedroli, Bas - Wageningen University & Research (Presenting author)
Keywords: landscape, society, collaboration
Presentation Preference: Oral

Heritage values represent a common good, contributing to societal identity. Landscape is a topical issue here because it represents character and identity in both a spatial and a temporal dimension, uniting at the same time natural and cultural aspects of heritage. Especially in Europe, practically all Natural Heritage can be considered Cultural Heritage as well, since it is through human action that Europe's biodiversity has evolved. Heritage perspectives on landscape and nature underline time depth, human agency and social value within landscape, landscape's cultural construction in past, present and – most importantly – future. Its cultural starting point does not marginalise nature, but places nature within cultural filters, thus highlighting the reciprocity of nature and culture in the creation of sustainable places. Today's changing society is in transition towards forms of governance dominated by collaboration, actor-networks and social media. Examples will be given of cultural landscapes in which heritage management approaches benefit from combining natural (referring e.g. to the Convention on Biological Diversity) and cultural heritage (related to various conventions on e.g. World Heritage). In this context, commonly-accessible heritage can bring people together in joint efforts to use the inherited landscape as a resource to be shared and cherished rather than to be conserved only by regulating ownership.

03 HERCULES: MANAGING LANDSCAPES OF THE "LONG NOW"

Author: Prof. dr. Kolen, Jan - Leiden University. Leiden, The Netherlands (Presenting author)
Keywords: landscape, capturing, change
Presentation Preference: Oral

In December 2013 a new large-scale program was launched for the research, protection and management of the European cultural landscapes within EU Seventh Framework Programme: HERCULES (Sustainable Futures for Europe's Heritage in Cultural Landscapes). One of the projects of HERCULES (Work Package 2) aims at the development of an innovative framework for understanding the long-term development and human transformation of cultural landscapes, linking past, present and future. Instead of engaging in fruitless discussions of which model or theory is preferable, the framework starts from the pragmatic observation that landscapes do not just survive, but must be maintained. This emphasizes the importance of "capturing" (Gunn 1994): the long-term transmission of cultural information about the environment, combined with the more short-term intergenerational exchange of knowledge and memories. "Capturing' is of crucial value for the human guidance of landscape change, including the ecosystem services and cultural heritage that are involved in this process. In this way, HERCULES Work Package 2 is meant as a modest contribution to the study of landscape as a lens on the "long now" dimension of human societies and their relationships with the environment. This entails and promotes the viewing of landscapes as both the interim outcomes (and archives) of long-term change and human intervention in the Earth system and as productive settings for future solutions to current environmental issues.

04 CONNECTING NATURAL AND CULTURAL HERITAGE PRACTICES

Author: Schlaman, Marjo - University of Amsterdam (Presenting author)
Keywords: Integration, nature, culture
Presentation Preference: Oral

In the last decade, the awareness of the interconnection between natural and cultural heritage have led to the adoption of integrated landscape management approaches by professionals of both domains. New approaches can ease the implementation of more efficient planning strategies, which entails a more effective and efficient use of available resources, and ensures the efficient integration of landscape into regional and town planning as well as into cultural, environmental, agricultural, social and economic policies. Multidisciplinary teams have a crucial role in applying joint approaches to the conservation, protection and management of archaeological and natural heritage. This can be defined as internal integration. However, there are obstacles concerning landscape policies with a traditional environmental and/or ecological focus that lack cultural heritage policy input. An integrated approach can explore alternative strategies, and can identify barriers to problems and provide solutions; it is therefore a better basis for decision-making. Above all, it offers new insights into complex problems. Nevertheless, integrated approaches are no solution to each and every problem in the field of landscape heritage management. They may be most promising for sustainable landscape management; different disciplinary approaches still can be suitable for specific spatial environmental problems. Choosing the right approach depends on problem definition and the project's goal, dependency on each other's frameworks, methods and philosophies, and organisational aspects.

05 LANDSCAPE OF VISIONS. NATURE AND CULTURE IN THE PARKS AND GARDENS AT THE MANORIAL ESTATE EKOLSUND IN SWEDEN.

Author: Associate Professor Ahrland, Asa - Department of landscape architecture, planning (Presenting author)
Keywords: designed landscapes, conservation
Presentation Preference: Oral

Parks and gardens are defined by constant change and by continuous recreation, expressing artistic and human ideals from different eras. Characterized by their complexity, designed landscapes contain a multitude of historic layers, reflecting visions of the past. Not only do they constitute cultural values, but they are also places of biodiversity and other values. So how does one conserve and develop a large designed landscape with a long complex history? Does complexity represent a problem to garden conservation, or is it an opportunity to create interesting multidimensional landscapes with different values and narratives? Ekolsund, ca 40 km NW of Stockholm, was one of the first sites in Sweden which was subject to an Europeanization in the 17th century. The 14th century manor was replaced by a large-scale manorial estate suitable for the field marshal Åke Thott and his family. According to the latest French fashion, vast gardens were laid out with parterres, bosquets, waterworks and grand avenues. There were large kitchen gardens, nurseries and extensive deer parks. Further layers have been added by later owners. Today the site is protected, although legislation has compartmentalized the landscape. The former deer parks on one side of the road form part of a nature reserve and the manor on the other side is protected as a historic monument. The structures of the 17th century, though aged and dilapidated, remain in the garden, while a central area is managed to protect biodiversity. It is paradoxical that a landscape once designed as an expression of culture, now is perceived as nature. This paper argues that the complexity of multi-layered landscapes, such as gardens and parks, make them particularly suitable for inventive conservation strategies, where biodiversity and cultural values could, rather than oppose, complement each other.

06 MIND THE GAP! OVERCOMING DISCIPLINARY BOUNDARIES

Author: Dr. Van Londen, Heleen - University of Amsterdam (Presenting author)
Keywords: Strategy, heritage, integration
Presentation Preference: Oral

For the experts working within set frameworks of legislation and institutional divides – be it within ecology or cultural heritage -, there are mainly four basic strategies that can be organised within a given workplace. These strategies, or even tactics, differ in their increase or decrease of actual sectoral integration and the effort that has to be made for a joined approach to both natural and cultural heritage. This paper will go into the four strategies for crossing disciplinary boundaries.

07 CULTURAL AND NATURAL HERITAGE: A MARRIAGE OF CONVENIENCE?

Author: Ruiz del Árbol Moro, María - CSIC (Presenting author)
Co-Author: García Basanta, Sonia - CSIC; Pecharromán Fuente, Juan Luis - CSIC
Keywords: landscapes, heritage, management
Presentation Preference: Oral

Spanish practice related to the protection, development and management of Natural and Cultural Heritage is characterised by the difficulty of establishing a connection between both heritages. Furthermore, landscape management is marked by the gap between disciplinary approaches and a weak transference of outcomes of research. This results in a panorama in which protection is mostly based on "aesthetic- reconstructivist" approaches and management is marked by the problematic balance between heritage and tourism on one hand and the importance given to environmental issues within spatial planning policies on the other hand.

Our work within the research project "Heritage sites as tourism assets of the Community of Madrid. Problems and opportunities in territorial perspective" is analysing several case studies within the rural areas of the region of Madrid, aiming for produce a guide with good practice recommendations on integral landscape valorisation and management. Our objective is to build bridges between the various administrations and to propose a series of coherent basics for an integral valorisation and management of landscapes, in order to reinforce the role of Cultural Heritage in the environmental and social policies of the region.

Our paper will address through several case studies, current approaches to landscape management within the region. It will present our proposal for a combined and integrated approach of Cultural and Natural Heritage management. It will mainly focus on presenting the landscape as a product of history and the transfer of knowledge to the wider public while debating different forms of public engagement.

08 INTEGRATING CULTURAL AND NATURAL RESOURCE MANAGEMENT IN THE UNITED STATES

Author: Dr Altschul, Jeff - Statistical Research, Inc./SRI Foundation (Presenting author)
Co-Author: Dr Heilen, Michael - Statistical Research, Inc.
Keywords: Resource Management
Presentation Preference: Oral

To make resource management in the United States more streamlined, efficient, and cost-effective, landholding agencies are under increasing pressure to integrate cultural and natural resource management approaches and to do so earlier and more comprehensively in planning processes. Stakeholders, particularly Native American tribes, have long argued that cultural and natural resources need to be managed together as a unified whole. Further, many federal agencies now recognize that landscape-level planning and management are necessary to manage the thousands of cultural and natural resources under their jurisdiction and have begun to develop integrative, landscape-level management approaches. Exactly how to achieve this integration is poorly understood and understudied, however. Part of the problem is that the laws, methods, and tools used to manage resources differ significantly between cultural and natural resources. Natural resources are managed by protecting or rehabilitating habitats and ecosystem services that support endangered species, rather than managing endangered species themselves. Cultural resources are managed by identifying and protecting the archaeological sites themselves, rather than the natural resources and landscape elements to which those sites pertain. To achieve an integrated approach to landscape-level management, we need to shift the focus from managing individual archaeological site by themselves to defining cultural landscape elements and resources and identifying their relationship to natural resource management units and concerns. In this paper, we outline a proposed approach that uses archaeological predictive modeling, cultural historical information, and resource classes to geospatially define cultural landscapes, predict resource distributions and values, and identify opportunities and protocols for managing cultural and natural resources collectively. As the United States faces increasing de-regulation and limited preservation funding, we believe such an integrated approach will be critical in preserving and protecting both our cultural and natural heritage.

09 THE ROLE OF HERITAGE IN SOCIETY: A HUMAN RIGHTS PERSPECTIVE

Author: Edeso, Mikel - Aranzadi Science Society (Presenting author)
Keywords: sustainability, society, heritage
Presentation Preference: Oral

Through the past few decades, different modes of thinking about the meaning of heritage in society have taken shape and form. Universal and European perspectives coexist with an increasingly influencing mode that intertwines heritage with Human Rights, where people have many different identities and freedoms that depend on respecting all individuals. Hence, heritage is associated with politics, identity and territory, but also with social values of wellbeing.

This paper aims to offer a brief overview of the Human Rights perspective unifying concepts like heritage and citizenship, society and sustainable development. Moreover, the paper will discuss the inclusion of cultural heritage in the climate change discourse, which may reinforce the international community's obligation to take mitigation activities and impose an extra layer of obligation of governments in their fight against climate related issues.

10 CULTURAL AND NATURAL CAPITAL IN ENGLAND. CHALLENGES AND OPPORTUNITIES FOR EMBEDDING HERITAGE IN ECOSYSTEM SERVICES APPROACHES TO THE ENVIRONMENT.

Author: Dr Fluck, Hannah - Historic England (Presenting author)
Co-Author: Lake, Jeremy - FSA
Keywords: ecosystem services, heritage
Presentation Preference: Oral

The natural environment sector in the UK has undergone something of a transformation as it shifts its focus from the environment and ecosystems to the relationship between the environment and people. The language of Ecosystem Services and Natural Capital is underpinning aspects of policy and practical land management plans, but it can be difficult for professionals outside the sector as well as communities and non-professionals to identify and engage with. The challenge for the historic environment sector is to ensure that the historic and prehistoric contexts for the relationship between people and the environment is used to inform this approach. On way this can be achieved is through bringing together professionally disparate but fundamentally inter-connected aspects of places to enrich and stimulate understanding of how they both result from and can inform past and future change. In this paper we explore the challenges and opportunities in England for better integration of cultural and natural heritage from policy to practice. We draw upon examples ranging from the archaeology and ecology of historic routeways to neighbourhood planning, and experiences of working with policy makers, land managers, planners and communities.

11 HERITAGE AND THE PUBLIC: CROWD-BASED INITIATIVES

Author: Travaglia, Andrea - University of Amsterdam (Presenting author)
Keywords: heritage, public, participation
Presentation Preference: Oral

Heritage is part of a complex political framework. It is intertwined with human rights, identity and freedom of expression. Heritage must take into account the relationships between individuals and different communities, so as to promote understanding and long-term sustainability for the future. The belief in the power of technology to shape and improve society can be observed through the worldwide movement towards the integration of economics, finance, trade, and communications across nations. In this regard, there is high potential for online platforms to guide and support individuals and communities in finding their own voice, to gather contributions of crowdsourced content and funding, to discuss discoveries, and foster online networks and communities situated around heritage issues.

Within this presentation I will discuss how various online platforms have encouraged creative problem-solving in the heritage sector. While online communities are still a relatively new concept for the field of heritage, they are increasingly important when considering the global perspectives of heritage building with regard to the various voices, content, identities, and political issues. Thus, exploring online crowd-based initiatives is interesting in view of the communication exchange amongst individuals and communities offline and in the 'real' world.

12 HERITAGE DISCOURSE IN SOCIETY - EXPERT & PUBLIC KNOWLEDGE

Author: Dr Kajda, Kornelia - Adam Mickiewicz University in Poznań (Presenting author)
Keywords: heritagization, economy, society
Presentation Preference: Oral

Taking into account recent considerations and analyses of the meaning of heritage for professionals and the public, we can conclude that almost everything may be treated as heritage today and that the heritage sector is rapidly developing and having influence on politics, economy and society around the world. Iron Age pots, Second World War bunkers, contemporary murals, old trees, unique topography of the terrain – these are only limited examples of what heritage is today. Presented approach has various implications for heritage discourse in society and the professional sector. It is also often a point of disagreement between the two.. In the presentation I will discuss the main points of heritage discourse and practice in Europe (with special attention to Poland) from the perspective of expert and public knowledge. I will focus on the cases in which social expectations towards heritage politics are met and on the ones in which public and professional sectors cannot reach an acceptable consensus. The aim of such presentation is to discuss the possible ways of resolving problems that arise between experts and public taking into account heritage discourse.

13 WET AND WONDERFUL: NATURAL AND CULTURAL HERITAGE WORKING IN HARMONY IN THE SOMERSET WETLANDS, UK

Author: Dr Brunning, Richard - South West Heritage Trust (Presenting author)
Keywords: Management, engagement, landscape
Presentation Preference: Oral

The Somerset Levels and Moors are an extensive wetland in England, valued for their internationally important natural and archaeological heritage. Co-operation between the two disciplines has been exceptionally good over the last 20 years or more. The interests of both natural and cultural heritage organisations have a shared vision for sustainable management of the wetlands at a landscape and an individual site scale. Natural and cultural organisations work together to preserve in situ wetland archaeological sites such as the Neolithic Sweet Track or the Iron Age Glastonbury Lake Village.
Natural and cultural organisations also join forces to present information to the public in a number of forms, such as archaeological reconstructions on nature reserves, shared guided walks and wetland festivals. The complex and dynamic landscape history of the area is seen as part of a long story of change that now sees nature organisations recreating wetland landscapes last seen in prehistory. Archaeology reminds local people that they live in a dynamic, ever changing wetland landscape. This helps build support for, and acceptance of, attempts to create a more natural and sustainable environment.

14 EDUCATION FOR PROFESSIONALS

Author: Rocks-Macqueeen, Doug - Landward Research Ltd., UK
Co-Author: Marciniak, Jacek - Adam Mickiewicz University, Poznań, Poland (Presenting author)
Keywords: Education, professionals, heritage
Presentation Preference: Oral

For most people the early years of their lives are spent in school learning. From preschool to University one never stops learning and the same is true after one leaves University, especially for continued professional development. However, the ability to continue to learn is curtailed by working hours and locations. Due to time restrictions and geographical dispersion distance learning is usually required. This paper will review the distance learning platform created as part of the ANHER project. It will examine how due to different needs and competencies flexible tools for training preparation were needed and how this project delivered that. Specifically how we create one hub with trainings offer for each professional domain, the HEP portals.

303 WHO OWNS THE BATTLEFIELD?TRANS- AND METADISCIPLINARY APPROACHES IN ARCHAEOLOGY

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Kok, Ruurd (Netherlands) - RAAP Archaeologisch Adviesbureau
Co-Author(s): Bracke, Maarten (Belgium) - Monument - Van de KerckhoveSeitsonen, Oula (Finland) - University of Helsinki, ArkteekkiWijnen, Jobbe (Netherlands) - Wijnen Cultuurhistorisch OnderzoekSchute, Ivar (Netherlands) - RAAP Archeologisch AdviesbureauVerdegem, Simon (Belgium) - Ruben Willaert bvba
Keywords: conflict-archaeology, ethics, social justice
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Battlefields are multilayered and meaningful places. On these battlefields they are likely to meet a wide range of people, not in the least relatives of soldiers who fought or died there. Relatives consider these fields to be a place of memory and mourning. Battlefields are also considered potentially dangerous because of the possible presence of unexploded ordnance.The process of professional clearing the battlefield from these war relics can be in conflict with the cultural value of battlefield for stakeholder groups, be a form of social injustice, or simply damage the research potential of the battlefield. Moreover, battle fields are also visited by tourists who want to visit, see and feel the places where it all happened, or metaldetectorists hunting for war relics.

What is role of the archaeologists in this field of possibly conflicting meanings? How are archaeologists to reckon with the highly emotional meaning of these places, including his/her own? Can personal experience be a reason for archaeological research, or on the contrary: a reason to refrain from research?

The aim of the session is to explore the dilemmas towards in researching battlefields and conflict sites. Ultimate goal is to formulate a set of 'rules of engagement' for archaeological research on battlefields. We focus on modern warfare and conflict (WWI, WWII, post-WWII). We want to have an extended, in-depth discussion on the theme in a discussion-session (PechaKucha); we want to avoid a discussion on policy or legal issues. We invite colleagues to share their own experiences and dilemmas.

01 WHO OWNS THE WILDERNESS? SECOND WORLD WAR HERITAGE IN FINNISH LAPLAND

Author: Mr Seitsonen, Oula - University of Helsinki (Presenting author)
Keywords: Heritage, Lapland, ownership
Presentation Preference: Oral

Over the last decade archaeologists and other cultural heritage professionals have started paying attention to the material legacy of Nazi German presence in Finnish Lapland during the World War II, as Finland's co-belligerent in the fight against the Soviet Union. At the peak of their military built-up there were over 200 000 German troops and about 30 000 of their multinational Prisoners-of-War and forced labourers in this thinly inhabited northern periphery of Europe. The Finno-German "comradeship-in-arms" came to an end under Soviet pressure in 1944, after Finno-Soviet cease-fire, and caused the outbreak of Lapland War between Finns and Germans. This ended up with the "Burning of Lapland" by the retreating German troops. Finno-German relations have thus been a sensitive and little-discussed issue throughout the post-war decades. There are ruins of thousands of over-grown German military sites in northern Finland, especially in Lapland's vast wilderness areas. The question of the cultural heritage status and value of this material legacy has been raised only recently, and is still an open debate. However, during the archaeological and ethnographic inquiries it has been highlighted how important the material traces are for the local inhabitants, as an integral part of their ancestral, embodied every-day lifeworlds. They generally express a strong sense of ownership and custodianship towards the material remains on their "own lands". The traces of war also act as important agents of the transgenerational communal memories of war, destruction, and a host

of other issues beyond those, closely intertwined with contemporary questions. These also mirror Lapland's long colonial history and, real and perceived, marginalization by the southern authorities, and the enduring north-south confrontations.

02 'CONFLICT ARCHAEOLOGY ON DISPLAY': THE INTERACTION BETWEEN WAR MUSEUMS AND ARCHAEOLOGISTS IN FLANDERS

Author: Heyvaert, Bert - Group Monument; Conflict in contact (Presenting author)
Keywords: museums battlefields Flanders
Presentation Preference: Oral

This paper wishes to explore the special bound that is being shaped between world war 1 museums and conflict archaeologists in Flanders. The consequences for their field of activity are the main issues that will be adressed.

Over the last decade, conflict archaeologists have taken an increased interest in places that have been touched by the first world war. Over the same period, the main museums dealing with this conflict in Flanders, have also re-discovered the battlefields. Today, all officially recognised WW1-museums have established strong ties to the battlefields in their planning policies. They are now generally being considered an extension to their fixed displays. Furthermore, 'battlefield relics' have always had a prominent place in museum collections. Their profound effect on visitors raises a certain demand.
As a result of all this, the hidden layer of what lies preserved beneath the battlefields' surface, is of significant importance to Flanders' war museums. However, the acces to these remains is in most cases reserved to archaeologists, leaving museums dependend on their work. As a result, an interaction is being shaped that raises its own questions. What is the influence on archaeologists working on the battlefields? How does it effect their approach and the organisation of their work? What are the expectations of museums when it comes to the archaeology of the battlefields and the acquisition of 'battlefield relics'? Are they compatible with the deontology of professional modern archaeology?

03 THE OWNERS OF THE BATTLEFIELD ON THE GREBBEBERG MOUNT - IN CONFLICT WITH EACH OTHER.

Author: Drs Schute, Ivar - RAAP Consultancy
Co-Author: Drs Kok, Ruurd - RAAP Consultancy (Presenting author)
Keywords: conflict-archaeology world-war
Presentation Preference: Oral

In May 1940 over 700 soldiers were killed on the Grebbeberg Mount, the majority of them Dutch. This made the battle for Grebbeberg Mount the bloodiest engagement on Dutch soil in WWII. From 2009 onwards several archaeological researches were conducted on this battlefield with a primary focus on WWII. In retrospect one could argue that the Grebbeberg Mount served as a test area for archaeological research on modern conflict sites.
The clients for these researches vary, as do all the different owners of the Grebbeberg Mount. It is owned by over ten different organizations, seen from an emotional, symbolic, historical, juridical, societal or practical perspective. This field of tension will be described and entangled, as the role of archaeologists will be highlighted as a mediator between these owners. The dangers and dilemmas of this, will be food for discussion.

04 ARCHAEOLOGY OF EMOTIONS: EXCAVATING THE BATTLEFIELD

Author: Archaeology of emotions: excavating the battlefield Verdegem, Simon - Ruben Willaert bvba (Presenting author)
Keywords: Battlefield, emotions, relatives
Presentation Preference: Oral

Battlefields are meaningful places for all kinds of people, and not the least for relatives of those who fought, or even died, there. In this way, battlefield archaeologists have the 'privilege' to work on those places that are often considered sacred. In so doing they get really close to the history of the war, so close in fact that they can often actually 'touch' history. Many relatives seek a comparable experience whilst visiting the battlefields, but they seldom or never succeed. Therefore it could be considered that is the duty of battlefield archaeologists to bring the results of their research to the attention of those with the closest connections to the battlefield itself. Because of their emotional value, getting these results publicly accessible could be considered a necessity, but at the same time this accessibility opens a lot of sensitive questions that need to be taken into account, questions that need to be handled delicately. This can be achieved, among other things, by making sure that the excavation is carried out with proper respect and appropriate attitude. But what are the do's and don'ts?
It is important also to recognise the feelings of the battlefield archaeologists engaged in the excavation. They too will be troubled by emotions, emotions that would need to be controlled in order to properly perform their roles. By doing this, the problem is faced that an emotional connection is necessary in order to thoroughly understand the deeper meaning of a battlefield as a place of remembrance. The peak of all those emotions is reached when during excavations the remains of a fallen soldier are discovered. How is the archaeologist to cope with this?
This paper further examines what protocols are to be followed in such circumstances, and what lessons there are that can be learned.

05 WHAT ABOUT METALDETECTING AND METALDETECTORISTS?

Author: What about metaldetecting and metaldetectorist? Bracke, Maarten - ABarcheologie (Presenting author)
Keywords: Metaldetecting, Archaeology, collaboration
Presentation Preference: Oral

This paper concerns about the role of metaldetecting and metaldetectorist combined with archaeologist and the methodology concerning the research of battlefieldgrounds. How can this be combined? What is the role of both parties? Is a collaboration possible?
The discussion concerns also the importance of artefacts in the topsoil? What about loose finds or the combination of loose finds on a larger-scale?
Many metaldetectorist have a great knowledge about artefacts. This knowledge and the collaboration can help the archaeological research.

06 INSIGHTS IN THE POSSIBILITIES OF AN ELECTROMAGNETIC INDUCTION SENSOR TO MAP THE MILITARY REMAINS IN THE FORMER WW1 FRONT ZONE.

Author: PhD Saey, Timothy - Universiteit Gent (Presenting author)
Co-Author: Note, Nicolas - Universiteit Gent; PhD Stichelbaut, Birger - Universiteit Gent; PhD Gheyle, Wouter - Universiteit Gent; Prof. Van Meirvenne, Marc - Universiteit Gent
Keywords: EMI, WW1, non-invasive
Presentation Preference: Oral

On November 11th 1918, the military impact on the Western front zone was called to an end. Almost a hundred years later, traces of this war are still reflecting in the landscape: cemeteries, mine and shelling craters, bunkers, high concentrations of metal shrapnel, bomb shells rising from the subsoil, etc. ... Above surface remains are easy to identify in the current landscape. A more rising question is what is still buried beneath the surface. This unknown data is one of the research topics in the UGent's integrated research project 'Non-invasive landscape archaeology of the Great War' (2014-2018). For this project, 220 ha were already scanned at the former front zone in Belgium with an electromagnetic induction sensor (EMI) by the Department of Soil Management to investigate the buried remains of this War. Site selection and archaeological feature interpretation of the scan results were guided by the expertise and photograph database of the Centre for Historical and Archaeological Aerial Photography (Ghent University, In Flanders Fields Museum). This collaboration opened up a series of insights in the possibilities and limitations to investigate buried WW1 archaeological structures in a non-invasive way. Because of the scale and the spread of the EMI-surveys, we can compare data parameters collected at several locations in this formal war zone.

07 BENEATH THE SURFACE

Author: Dr McWilliams, Anna - Södertörn University College (Presenting author)
Keywords: battlefield, WWII, wrecks
Presentation Preference: Oral

The Baltic Sea has been the arena for many battles over time and below its surface the physical traces still remain. Spread across the ocean floor are materials from all periods such as wrecks, physical barriers, human remains and weapons. There is great interest in these sites from various parties but they are often hard to access. This tends to limit visitors to those with a diving certificate and in some cases prevents visitors altogether. Many of the sites are still hidden. With improvements in technology, however, these sites are being increasingly discovered and can also be visited remotely using robots.
However, archaeologists are mainly interested in remains dating to the 18th century or older. This means that physical remains relating to modern conflict have, until recently, received little attention from archaeologists. Instead there are many other interested parties, in particular divers. My studies are some of the first carried out from an archaeological perspective on modern material in the Baltic Sea but the work has been far from smooth. I have had to navigate my way continuously between the diving community, relatives of the deceased, military historians and a curious general public who generally have different motives and interests and my presence within the field is not always welcome. I would like to contribute my experience of working with World War II remains in the Baltic to the discussion of this session as I often struggle myself with how I, as an archaeologist, fit in among these different parties.

08 WORLD WAR 2 SHIPWRECKS: PLACES OF CULTURAL SIGNIFICANCE, WAR GRAVES OR FOR ECONOMIC GAIN?

Author: Drs. Manders, Martijn - Maritime Programme of the Cultural Heritage Agency of the Netherlands
Co-Author: Drs. De Hoop, Robert - Maritime Programme of the Cultural Heritage Agency of the Netherlands (Presenting author); Gombert, Merijn - Maritime Programme of the Cultural Heritage Agency of the Netherlands
Keywords: shipwrecks protection value
Presentation Preference: Oral

In the early 1980's when underwater archaeology was still in its infant state, iron shipwrecks, especially those from the World Wars and after, were of no interest to the professional archaeologists. They focused on the wooden wrecks from before 1800. On the contrary sports divers were mainly active on these sites because they were large, sticking high above the sandy seabed and were also full of sea life.

Now the approach towards shipwrecks from this newer period has completely changed. Archaeologists nowadays see the surplus of studying these relatively young sites because it turns out they tell more than the historical information provides us about these historically important periods. Objective information from a time in which contemporary documents are almost per definition not objective.

Although the Second World War ended almost 75 years ago, there are still people alive that experienced the disasters at sea. Families are still dealing with the loss of brothers, sisters, sons, daughters and other relatives that died on these ships. These people consider the wrecks to be war graves. In some countries these wrecks therefore have an official status while in other countries they don't. There these shipwrecks may be threatened by another value they have: economics. Copper, lead and steel from the seabed are literally worth millions. Salvaging companies happily make use of that and by destroying the wrecks and lifting the material they take away the only hard substrate from the seabed which has an effect on the biodiversity and also the places for enjoyment: the large steel wrecks that are so great to dive to.

All these different values make the management and protection of shipwrecks at sea a complex task. What should prevail? Is this only the cultural value? Or can we make everybody happy?

306 INTEGRATING NATURAL AND CULTURAL HERITAGE: POLITICAL CONDITIONS AND FUTURE DEVELOPMENTS

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Schlaman, Marjo (Netherlands) - University of Amsterdam
Co-Author(s): Marciniak, Arkadiusz (Poland) - Adam Mickiewicz University, PoznańVan Londen, Heleen (Netherlands) - University of Amsterdam
Keywords: politics, discourse, impact, heritage, transdisiplinarity
Presentation Preference: Session with a key note speaker with contributions from discussants and discussion
Speaker: Rosa Martinez (Spokeswoman for the Spanish Green Party - EQUO and Member of the Spanish Parliament)

This discussion involves the integration of natural and cultural heritage with the external world, including land use planning, societal values and governance. It addresses recent shifts in understanding the role of heritage from that of memory and identity to human rights, justice and well-being. Moreover, it discusses key components of heritage engagement with external bodies, including networks and communities of practice, online and offline communities, and different forms of public discourse. Heritage management has grown from a narrowly defined practice of protection to complex strategies of sustainable development and spatial transformations. Management strategies have been developing in response to changing social conditions, political circumstances and economic situations. Furthermore, resilience of landscapes and ecosystems have historically guided thinking about landscape management. A recent shift in thinking about global challenges triggered a significant shift in management policies to focus on humane values, landscape perceptions and ecology, and eventually alternative futures as an outcome of mediation between human actions and natural processes. The session discusses potential challenges facing both cultural and natural heritage as a result of rapidly changing European and national policies. This includes broader changes such as climate change, global warming, pollution, and large-scale migration. Furthermore, it debates the new role of heritage in an ever changing framework for land use, infrastructural investment and sustainable development at the national and international levels. It also discusses the most effective means of presenting and communicating the sectoral goals, concerns of planners, local administrators and policy makers. This session follows-on from this morning's programme.

01 CHANGES AND CHALLENGES FOR EUROPE'S HERITAGE

Author: Martinez, Rosa - EQUO and Member of the Spanish Parliament (Presenting author)
Keywords: Europe, politics, heritage
Presentation Preference: Oral

Europe is facing several challenges and issues which threaten the European project as it was conceived. The global crisis, with different dimensions (economic and financial, social, political and ecological crisis), is shaking the world that was shaped after World War II. Our economies are not growing as they used to, the welfare state is shrinking and inequality is increasing. Globalisation has changed Europe's role in the world and, for the first time in decades, political fronts that neglect human rights have options to win. Global challenges, such as climate change and migrations, and their consequences in economy and societies, are an essential part of the debate and a central question for our future. Heritage management should not be indifferent to what is changing in our society, nor should it be detached from people's concerns and the challenges they face that need to be addressed. These changes will affect the funding, perception, function and practice of heritage management. Should we continue, business as usual, hoping everything returns to "normal"? This keynote paper will deal with the main changes and challenges we are facing in Europe and their expected impact on heritage management practice and its role. It will invite a reflection on the political context in order to build a strategy for adapting the heritage management practice and framing it to the political, social, ecological and economic context for the 21st century

02 THE IMPACT OF THE COMMON AGRICULTURAL POLICY ON ARCHAEOLOGICAL HERITAGE. CAUSE AND REMEDY?

Author: Mr Cordemans, Karl - Flemish Land Agency
Co-Author: Mr Byrnes, Emmet - Department of Agriculture, Food and the Marine (Presenting author); Mr Van Rooien, Cees - Rijksdienst voor het cultureel erfgoed (Presenting author)
Keywords: Heritage management, Policy
Presentation Preference: Oral

Since rural land uses (most notably agriculture and forestry) are amongst the most destructive of processes acting on the archaeological historical landscape in Europe, the The joint EAA and EAC Working Group on farming, forestry and rural land management is particular concerned with the fact that these processes, in contrast to construction and development, have few or no widely established mechanisms for archaeological impact assessment, avoidance or mitigation. The working group therefore is actively monitoring developments in European policy regarding agriculture and forestry and is trying to get heritage management on their agenda.
This paper will present a short overview of recent developments and examples of realisations in different member states. We will conclude with a look to the future and the CAP 2020.

03 LEGITIMACY OF STATE CONTROL OVER HERITAGE SITES: THE CASE OF TURKEY IN HISTORICAL PERSPECTIVE

Author: Assist. Prof. Dr. Akture, Zeynep - Izmir Institute of Technology (Presenting author)
Keywords: Turkey, legislation, legitimacy
Presentation Preference: Oral

Heritage legislation in Turkey dates back to the first Ottoman antiquities law of 1869 that banned exportation of antiquities except in ancient coins, and attested property rights of private owners over lands wherein antiquities were discovered. The second law of 1874 declared all moveable antiquities as state property, to which immovable property was added by a third law in 1884 that also introduced expropriation while banning demolition and unauthorized repairs by private landowners. The final Ottoman antiquities laws of 1906, introducing ownership rights of landowners over antiquities in their property, and of 1914 for immovable property stayed in force up to the first Turkish Republican Antiquities Law of 1973, which broadened the concept of heritage to the scale of sites. The replacing Law for the Protection of Natural and Cultural Property in 1983 expanded responsibilities of the Higher Council of Immovable Antiquities and Monuments, established in 1951, to Regional Councils for the Protection of Immovable Cultural and Natural Property. Working under the Ministry of Culture and Tourism, these consisted of experts who controlled physical planning and interventions in registered natural, archaeological, historic and urban sites. While differentiation of these four types of registered sites has always been a major drawback against development of integral management policies, the divide between natural and cultural sites has deepened recently, through authorization of the Ministry of Environment of Urban Planning, established in 2011, with decisions on natural sites,

apparently to facilitate implementation of comprehensive infrastructural and development projects, in a period when integrated sustainable management policies are on the European agenda. In this paper, I will first outline the gradual control established by the State in Turkey over heritage properties through legislation changes, and then question the legitimacy of this control in reference to the framework set by Jürgen Habermas in Legitimation Crisis (1975).

308 FADING IN AND OUT OF VIEW. COPPER AGE INNOVATIONS IN THEIR SOCIAL CONTEXT

Theme: 6. Interpreting the archaeological record
Author: Hofmann, Daniela (Germany) - Universität Hamburg
Co-Author(s): Siklosi, Zsuzsanna (Hungary) - Eötvös Loránd University
Keywords: Copper Age, innovation, knowledge, practice
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The Copper Age in central Europe is a time of profound change during which new long-distance networks are established. These are often discussed from the point of view of a separate sphere of 'exchange', with the different social mechanisms operating beyond processes of diffusion being hardly understood.

In this session, we broaden the scope by stressing the multiple ways in which innovations are embedded in the life of Copper Age communities. This involves thinking about sets of knowledge and practices which also include routine practice, ritual, subsistence, landscape inhabitation and so on. In particular, we would like to think about 1) The kind of knowledge involved in the spread of an innovation – technological, cultural or ritual knowledge, or a combination? 2) The ways in which such items and practices are embedded in social relations: what makes an innovation attractive, how can it spread, and what know-how must move with it? Is it possible, or indeed necessary, to distinguish the mere spread of goods from the transmission of knowledge? 3) Why some items and practices are eventually transformed, abandoned or replaced.
We welcome papers which address one or more of the following themes:
- the diffusion of practices, worldviews and know-how (e.g. also architectural innovations, spread of technology, shared ritual practices etc.)
- the possible reasons for the eventual alteration, abandonment or replacement of sets of knowledge and material culture

01 FADING IN AND OUT OF VIEW: INTRODUCTION

Author: Dr Hofmann, Daniela - Hamburg University
Co-Author: Dr Siklosi, Zsuzsanna - Eötvös Loránd University Budapest (Presenting author)
Keywords: innovation, copper age
Presentation Preference: Oral

The Copper Age in central Europe is a time of profound change during which new long-distance networks are established. These are often discussed from the point of view of a separate sphere of 'exchange', with the different social mechanisms operating beyond processes of diffusion being hardly understood. In this paper, we introduce the main themes of the session and briefly outline the main debates.

02 PREHISTORIC INNOVATIONS AND DYNAMIC NETWORKS

Author: Dr. Klimscha, Florian - Excellence-Cluster TOPOI; Deutsches Archäologisches Institut - Eurasien Abteilung (Presenting author)
Keywords: diffusion, innovations, networks
Presentation Preference: Oral

During the 5th and 4th millennium, several essential technical innovation-processes can be traced in Europe, which in the long run will ultimately build the foundation for drastic change. However, the innovation process is not only significantly slower than in modern times, but also of limited impact for great parts of Europe (and large parts of the population?). This paper explores how different technologies are diffused in the 5th and 4th millennium, and it is discussed in how far the creation of long-distance networks in the 4th millennium is the prerequisite for the innovation "package" (Sherrat's Secondary Products Revolution) or whether these networks are the result of the diffusion of innovations themselves.

03 THE ADOPTION OF INNOVATIONS: SOCIAL MECHANISMS OF CULTURE CHANGE

Author: Professor Dr Fokkens, Harry - Faculty of Archaeology, Leiden University (Presenting author)
Keywords: Adoption of innovations
Presentation Preference: Oral

Archaeologists tend to think that as soon as an innovation is known, 'the world' changes. This makes the search for the 'first occurrence' relevant, so for the past decennia much of our work has centered on dating: first through typological sequences, later through 14C dating and other methods. However, there has been very little attention for the social processes in the adoption of innovations. Archaeologists seem to assume that this is self-evident, but is it really? Modern sociologists and economists have written many books on the adoption of innovations and the prerequisits, constraints, and mechanisms that influence such processes. I want discuss these processes againt the background of the work of Everett Rogers and discuss how archaeologists can develop a more informed approach to culture process and change with respect to the adoption of innovations.
In particular I will focus on the the adoption of new elements of burial traditions and material culture of the Corded Ware and Bell Beaker Cultures and on how these may have become an integral part of daily life. How can we explain that fundamental aspects of social practices, like burial gifts, and orientation of the dead, have been accepted in a uniform way over vast areas of Europe? If Corded Ware and Bell Beaker traditions were brought by migrants, as many assume and DNA evidence appears to suggest, is that a logical culture process? Is that what we have to expect will happen today with massive migrations all over Europe? Or was the past different form the future? Were the migrations we were dealing with different as well? I will not answer all of these questions, but hope to offer food for thought and consideration in future research.

04 TRACING THE DEGREE OF INNOVATION IN THE CHALCOLITHIC CERAMIC ASSEMBLAGES FROM EASTERN ROMANIA. THE CASE OF SHELL TEMPERED POTTERY

Author: Archaeologist Matau, Florica - Alexandru Ioan Cuza University of Iasi; Interdisciplinary Research Department-Field Science (Presenting author)
Keywords: Cucuteni, pottery, technology
Presentation Preference: Oral

The shell tempered pottery is considered as being an import from the North Pontic steppe area into the Cucuteni culture which was spread between the Eastern Carpathians and the Dniester River (Romania and the Republic of Moldavia) between 4600 - 3600/3500 cal BC.
The aim of this study is to establish the degree of innovation registered in terms of technological and functional parameters within the ceramic assemblages which contains shells as the main additive (the so-called Cucuteni C pottery) and, further, to identify to what extent the spread of the new techno-functional characteristics was determined by a continuous demic input or by more complex cultural processes. The questions we are raising in this study are: the adoption of these technological parameters is considered as advantageous when measured in terms of vessel functionality? are they part of a broader process of technical knowledge innovation, accumulation and diversification in terms of pottery production?
Typological, stylistic and stratigraphic analysis may not be sufficient for understanding the chronological relationship between Cucuteni painted pottery and the Cucuteni C pottery. In order to complement the results obtained using traditional archaeological methods and to distinguish between various production recipes we have applied a multi-analytical archaeometrical approach. We have used Energy Dispersive X-ray spectroscopy (EDX) for spot analysis of the matrix and temper of pottery samples and X-ray diffraction (XRD) to explore the firing temperature and the effects of the tempering agents on the mineralogical transformations due to different firing parameters. The microscopical investigation for detailed study of groundmass microstructure (low magnification) and the degree of vitrification (high magnification) was determined by Scanning Electron Microscopy (SEM) analysis.

05 NEW WINDS OF CHANGE. THE TRANSFORMATION OF THE POTTERY REPERTOIRE AT THE MÜNCHSHÖFEN SITE IN RIEDLING.

Author: Dr. Szilágyi, Márton - Hamburg University (Presenting author)
Keywords: pottery, Münchshöfen, Riedling
Presentation Preference: Oral

The pottery making tradition of the Late Neolithic Münchshöfen Culture in Southeast Germany and Northwest Austria is considered to be formed and transformed by both eastern and western influences. This approach and the majority of typochronological systems based on pottery aspire to draw the „big picture", the major directions of pottery evolution. However, by studying individual cases it has become clear that the actually observed patterns of pottery evolution often do not correspond well to the general image.
Analysing the pottery of an almost fully excavated Münchshöfen settlement in Riedling (Lower Bavaria) provides a great opportunity to observe the evolution of pottery making in detail. The main directions of development have been established by earlier research; on this basis the occupation of the Riedling site begins in the phase of the classical Münchshöfen pottery style, and ends within the late phase. Having a general image on both the Riedling pottery repertoire and the Münchshöfen pottery evolution provides the chance to compare them. Thus, the reception, the acceptance and the adaption of various technological, formal and decorational novelties can be studied from the perspective of one particular settlement community. It seems that some new elements are fully adopted, some of them are sporadically known, and others do not appear at all at this site. This presentation aims to draw a complex image of the choices and decisions regarding pottery transformation and evolution in Riedling.

06 COMMUNITIES OF DESTRUCTION: UNUSUAL DEPOSITS IN THE MÜNCHSHÖFEN CULTURE AS IDENTITY-MAKING PRACTICES

Author: Dr Hofmann, Daniela - Hamburg University (Presenting author)
Keywords: structured deposition, Münchshöfen
Presentation Preference: Oral

The Bavarian Münchshöfen culture sits at a crossroads between the various Epilengyel groups to the east and the core area of the Michelsberg phenomenon further west. Due to this bridging position, it is often discussed in terms of the 'admixture' of various traits, for example in pottery production or in the architecture of enclosure sites. There is currently less work investigating patterns in the spread of practices (how the single artefacts are linked together in socially meaningful actions). For example, the Münchshöfen custom of burying multiple individuals in former grain storage pits is part of a pan-European trend at this time, as Christian Jeunesse has shown. On the other hand, the Münchshöfen culture remains excluded from the so-called prestige goods networks of copper and Alpine jade, with potential repercussions for our narratives of Copper Age hierarchisation. This paper investigates one kind of practice, the structured deposition of (parts of) humans, animals and objects. After an attempt at characterising the deposits so far reported for the Münchshöfen culture, I compare their composition to selected examples from adjacent areas to draw out in how far similarities in structure and/or performance are evident. Finally, the role of such deposits in the creation of links and boundaries between the 'cultural groups' we define for this time period is discussed.

07 LONG DISTANCE RELATIONS AND SOCIAL CONTEXT OF A MIDDLE COPPER AGE HOARD FROM MAGYAREGRES (HUNGARY)

Author: Hornok, Peter - Dolabra Ltd.
Co-Author: Dr. Kiss, Peter - Savaria Museum; Lekri Group Ltd. (Presenting author)
Keywords: copper, hoard, Balaton-Lasinja
Presentation Preference: Oral

A deposit of 974 items was discovered in the winter of 2016 in an excavation of a Balaton-Lasinja settlement near Magyaregres (Hungary). The hoard contained only jewelries made of copper, marble and shell, which was placed into a typical Balaton-Lasinja vessel. The pot itself was found in a ditch of a house in an upside down position. The copper spiral bracelets, spiral tubular beads, stone beads and small copper beads are rare, but characteristic finds of the Copper Age, their analogies can be found throughout the Carpathian Basin and its neighboring territories, although the double spiral copper pendants have only northern parallels from the Jordanów/Jordansmühl area. During the Copper Age these raw materials are supposed to be procured from far distances. The territory of the Balaton-Lasinja culture lies in the border zone of Central and Southeast Europe, which is reflected in the composition of the hoard. The first aim of this paper is to present these relations of the Middle Copper Age. On the other hand, these kinds of objects might have been prestige items, which could have expressed a high social status, still, a very few hoards, personal ornaments and copper objects are known (even less from archaeological context) from Transdanubia.

08 A PLAY ABOUT MATERIALISED VISIONS: AXE-, DAGGER-, STONE-, BONE- AND ICE-PEOPLE ON THE MOVE

Author: Dr.phil.hist Gross, Eda - Kanton Zug, Direktion des Innern, Amt für Denkmalpflege und Archäologie,; University of Basel (Presenting author)
Keywords: Ace, dagger, statue-menhir
Presentation Preference: Oral

Actors: The central character is played by a contextualised copper axe blade, likely to be sacrificed, from the pile dwelling of Zug-Riedmatt (Switzerland). Other actors: Remedello axes and daggers, statue menhirs, buried and sacrificed bodies and objects, pine cones and even hallucinogenic mushrooms.
Change of scenes are manifold: copper mines around the Thyrrenian and Ligurian Sea; circum-alpine pile dwellings; burial and sacrificial sites like Remedello, Montelirio, and the ice-lake of Tisenjoch on the alpine divide; and the communication lines between these sites. Often they mark routes and gateways between different realms, states of matter.
The play is set in the second half of 4th/early 3rd millennium BC, starting from the early Thyrrenian arsenic copper mining. Merging micro- and macro-archaeological perspectives and mingling strictly separated categories of analyses will change traditional chronological and cultural narratives about this wave of innovation.
Once we connect materialities, places, communication lines, bodies and objects, the play is set in motion. Ways of prospecting, exploiting, creating, transforming, transporting, translating and interacting emerge. This play is much more vivid than the frozen and bloodless image of prevailing doctrines about prestige of hierarchical territorial elites. The presumption, that the lightning-fast spread and intense exchange of technological – and above all – spiritual knowledge and practises between western Mediterranean, alpine and cisalpine areas of copper outcrops was driven by small committed groups of mining and metal-working adepts, probably organised in secret societies, seems at least not less likely.
It is a play about metaphoric transformation of properties and costumes. Objects become alive, dressed and stripped like bodies, constantly switching their precious and beautiful raw material components between Copper, Flint, Serpentinite, rock crystal, bone, ivory, and amber. This scenario looks more like Alice in Wonderland than a success story of economic power and wealth.

09 IN THE MIDDLE OF NOWHERE – UNDERSTANDING THE SOCIAL ROLE OF COPPER AGE METALLURGY ON THE GREAT HUNGARIAN PLAIN

Author: Dr Siklósi, Zsuzsanna - Eötvös Loránd University (Presenting author)
Keywords: Copper Age, metallurgy
Presentation Preference: Oral

The Early-Middle Copper Age Tiszapolgár and Bodrogkeresztúr cultures were generally considered as the peak of Copper Age metallurgy in the Carpathian Basin primarily based on the distribution of heavy copper tools and gold ornaments. However, the potential natural sources of local copper metallurgy is obviously missing on Great Hungarian Plain. The former models based on the distribution of copper artefacts often confused the production and final use or deposition of artefacts.
The fully excavated complex site of a Copper Age cemetery and its contemporaneous settlement in Rákóczifalva-Bivaly-tó 1/c provides a unique opportunity to study the social role of metallurgy in the life of a community lived in the Middle Tisza region. Despite the abundance of metal finds in the cemetery, nor traces of local metallurgy, neither metal finds could be found in the settlement features.
Instead of the macroregional models focusing on the large-scale spread of copper artefacts, this presentation stresses on the local scale and discusses the social role of metals in the life of the local communities with the results of archaeometric, lead isotope data and AMS dating. Approaching from the local to the microregional and regional scales the social mechanisms beyond the spread of artefacts and technological knowledge will be discussed.

10 TOOLS OF DISTINCTION. THE APPEARANCE AND THE SOCIAL ROLE OF 'MILK JUGS' IN THE COPPER AGE OF EASTERN HUNGARY.

Author: Dr. Szilágyi, Márton - Hamburg University; ELTE University Budapest (Presenting author)
Keywords: pottery, Copper Age
Presentation Preference: Oral

The presence or absence of the so-called 'milk jugs' has been one of the most important criteria of differentiation between the Copper Age Tiszapolgár and Bodrogkeresztúr cultures. Basically the two mentioned pottery styles (or cultures) was separated based on this pot type, which is a common vessel in Copper Age cemeteries, for example in the most studied eponymous graveyard in Tiszapolgár-Basatanya. However, two important results of the last decade's research must be mentioned. Firstly, due to the growing number of new AMS-dates the unilinear model of the earlier Tiszapolgár and the subsequent Bodrogkeresztúr cultures seems to be questionable. Secondly, our knowledge acquired mainly from cemeteries has been broadened by numerous newly excavated settlements.
As a result of a lucky coincidence a Copper Age cemetery and in only a 80-100 meters distance a contemporaneous settlement was excavated near Rákóczifalva (Middle Tisza Region). Additionally, two more settlements of the same period were uncovered in the same microregion. During studying their pottery find material, the fact of the low occurrence of 'milk jugs' was salient: among the more than 4000 potsherds their number narrowly exceeded ten, whilst from the 79 burials of the graveyard we know cca. 40 pieces. In this presentation, I would like to show an image of a new item which occurs in particular contexts, and which might have been a distinctive tool, although not a chronological one, but rather an active social symbol.

11 NATURE OF CHANGES: SUBSISTENCE STRATEGY IN THE LIGHT OF THE MATERIALITY IN LATE COPPER AGE CARPATHIAN BASIN

Author: Dr. Fabian, Szilvia - Hungarian National Museum, Budapest, Hungary (Presenting author)
Co-Author: Dr. Marton, Tibor - Research Centre for the Humanities of the HAS, Institute of Archaeology, Budapest, Hungary
Keywords: innovation, subsistence, Baden
Presentation Preference: Oral

Complex changes can be detected during the fourth millennium BC in the Carpathian Basin, which can be related to the Central European Baden Complex. In our paper, we will highlight the material manifestation of these processes, particularly in the context of subsistence strategies. The large quantity of animal bones, ceramic material, tools of bone and chipped stone, and other household equipment recovered from Baden contexts are indicative of diverse relationships. On the one hand, these reflect regional variations within the complex, while on the other hand illustrating technological innovations and behavioral habits typical of Central European-wide processes during this era. Our observations are based on different sites from the western and central part of the Carpathian Basin, which represent the changes from the earliest to the last phase of the Baden Complex.

12 HERDER AND HIS CATTLE, UNIQUE PRESENTATION ON A COPPER AGED POTTERY FROM THE CARPATHIAN BASIN, EAST-EUROPE

Author: Fekete, Laszlo - Herman Otto Museum (Presenting author)
Keywords: human-like figure
Presentation Preference: Poster

Introduction: At Northeast Hungary, there is an surface coal mine. Due to the heritage conservation law, archeological excavations have been conducted there since 2007. During the excavations, many sites from various periods were discovered, for instance remains which are from neolithic, copper age, bronze age, La Téne and roman. Excavation of site VIII was started in 2015. Remains of a celtic settlement, copper aged settlement and a celtic cemetery were founded.
In this abstract unique copper aged findings are presented from the archeological site.
Findings: Copper aged features date to the late copper age, Baden culture.
The S5 feature was a huge, round storage pit. It contained many fragments of a cattle bones, which were not in anatomical order. On the bottom of the pit there was a burned layer. In this layer many pottery fragments, animal bones and spindle whorls were found. This pit might have been used for ritual purpose.
The most interesting pottery was a pot with unusual ornamentation. Triangular lines run on the top and the bottom of the pottery side. Between the lines, 2 or 3 cattle shaped carvings lay with a human-like figure. Presentation of herding on the pottery was very rare in the Baden culture. Up to the present day similar findings from the Carpathian Basin and East Europe a have not been discovered/ reported yet.

13 SHAKEN, NOT STIRRED – OLD METHODS AND ITEMS WITH NEW MEANINGS IN THE EARLY-MIDDLE COPPER AGE GRAVES, EASTERN HUNGARY

Author: Faragó, Norbert - Eötvös Loránd University, Institute of Archaeological Sciences (Presenting author)
Keywords: Copper age, lithics
Presentation Preference: Poster

The Hungarian research always considered the Copper Age as a distinctive period from the Neolithic due to many different factors. In the middle of the 5th Millennia BC the permanent tell settlements, as the basic focal points of social life ceased to exist. This phenomenon was reconstructed as a transformation to a more mobile way of life, contemporaneously large cemeteries appeared on the Great Hungarian Plain with many new burial customs. These new stationary monuments meant not just a simple connection between the living and the dead, but served as a media between different social groups and between distant regions. Volhynian flint was already known in the region at least half a Millennium, although the majority of the chipped stones originated from the nearing North Hungarian Range. Blade pressure technique was already known since the Körös culture, Early Neolithic from the Balkans, thus in a simple form and it was only a supplement beside the punch technique. Unretouched blade, serving as a funerary object is detectable since the LBK period, but only just sporadically. These three attributes met in the Tiszapolgár/Bodrogkeresztúr graves in the form of exceptionally large Volhynian blades crafted with lever pressure technique unknown in our territory before. Was all of this elements locally connected and invented or it is an adopted habit? Were these blades locally produced with the help of an artisan or they passed the Carpathians in a complete form? Were they used during every-day contexts or not? The fortuitous discovery and excavation of Rákóczifalva-Bivaly-tó 1/c. cemetery and contemporaneous settlements gives us the possibility to investigate these set of problems in a more complex way.

309 AT THE GAME TABLE: ARCHAEOLOGY IN (VIDEO)GAMES

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Dennis, L. Meghan (United States) - University of York
Co-Author(s): Linde, Lennart (Germany) - Goethe University FrankfurtPolitopoulos, Aris (Greece) - Leiden UniversityMol, Angus (Netherlands) - Stanford UniversityAriese-Vandemeulebroucke, Csilla (Netherlands) - Leiden UniversityBoom, Krijn (Netherlands) - Leiden University
Keywords: digital, gaming, media
Presentation Preference: Round table

The use of video games as a space to situate archaeological research has led to new and widely divergent areas of scholarship. The roundtable format allows for the incorporation of archaeologists studying in many different areas of the overall discipline, contributing research questions and methodological practices to discuss applicability and best practices within virtual and game worlds.

In this session, a companion to the papers presented within In Play: Archaeology in Video Games as a Metadisciplinary Approach, archaeologists concerned with working within immaterial spaces such as video games will discuss current issues in research and where the emerging field is headed. Attendees are invited to bring their own questions and experiences to the table as well.

The goal of this session is to provide an open forum for the discussion and evaluation of the current status of archaeology in video games. Several conferences and publications will take place during 2017 regarding archaeology and video games and an open roundtable session gives an excellent opportunity to both specialists as well as those interested in the topic to come together and discuss the results of the ongoing research.

310 SCIENTIFIC APPROACHES TO THE STUDY OF ORNAMENTS: FROM THE ARCHAEOLOGIST'S TOOLKIT TO BODY ADORNMENT IN THE PAST

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Guzzo Falci, Catarina (Netherlands) - Leiden University
Co-Author(s): Winnicka, Kinga (Poland) - University of WroclawVan Gijn, Annelou (Netherlands) - Leiden University
Keywords: Ornaments, microscopy, archaeometry, social identity
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Ornamentation of the body is recurrent across different societies and time periods. It generally takes a variety of forms: from objects added to the bodies of people to modifications of the body itself. Body ornamentation is often connected to group identity and cosmology; in addition, ornaments and their exotic raw materials have been circulated

through long-distance exchanges. Extensive variability is seen in terms of ornament types, raw materials, and attachment systems. In face of this cross-cultural and long-term importance, alongside material variability, a broad range of instruments of analysis has been used for studying archaeological bodily ornaments, especially beads. In the last 20 years, different scientific approaches have emerged, including optical microscopy at different magnifications, SEM imaging and SEM-EDS, micro-CT scanning, XRF, morphometrics, etc. Focus has been placed on one or several of ornaments' traits: raw material characterization and sourcing, morphology, technologies of drilling, carving and grinding, use and its duration, and material preservation. An important concern has been the use of non- or minor destructive analytical techniques. The present session invites papers concerned with the use of scientific approaches to the study of ornaments of different raw materials, such as stones, minerals, shell, bone, teeth, and metal. Focus on one or multiple aspects of ornament biographies are both welcomed. We also encourage a reflection on the different toolkits available for their study and the methodological choices that guided analysis. It is the final aim of the session to discuss the differences, advantages and shortcomings of selected methods of analysis.

01 X-RAY MICRO-CT HELPS ARCHAEOLOGISTS TO WRITE THE BIOGRAPHY OF ANCIENT ORNAMENTS

Author: Dr NGAN-TILLARD, DOMINIQUE - TU DELFT- Faculty of Civil Engineering and Geosciences (Presenting author)
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Keywords: X-ray micro-CT, ornaments
Presentation Preference: Oral

X-ray Micro-Computed Tomography (micro-CT) is an excellent technique to inspect small delicate beads. It reveals their composition and inner structure without damaging them. In particular the geometry of the narrow bead shafts becomes clear on micro-CT scans. Archaeologists can then draw conclusions about the way the beads were made, worn and, in some occasions, re-worked. The origin of the materials selected to make the beads, their production centre and trading routes can even be traced by combining micro-CT scans to other information, such as results of XRF analyses. Signs of post-burial deterioration become obvious. Forgery is easily detected. micro-CT scans also constitute a form of virtual preservation of the ornaments. Once stored in open source repository, they can be further exploited by various stakeholders (musea, archaeologists, the creative industry).

The potential of micro-CT is illustrated for two collections of ancient Dutch ornaments: the Neolithic amber beads recovered from several graves and Early Iron Age frothy glass beads from Zutphen.

The role of amber beads in the materiality of burial practices in three different periods of the Dutch Neolithic has been investigated by combining microscopy and micro-CT. The scans allowed to evaluate the quality of manufacture and repair of the beads and detect signs of wear, re-shaping and post burial degradation.

About 60 glass beads were recovered from an Early Iron Age urn-field near Zutphen (NL). Glass is rare in this period in the Netherlands and has been investigated, first, to determine from what primary glass production centre this glass originated, and by what route it could have reached the Netherlands, and second, to determine the nature and origin of the frothy structure of the beads. With its many glass bubbles, copper fillings and mineral inclusions, the glass of the Zutphen beads does not resemble glass from Mediterranean production sites.

02 MAKING STONE BRACELETS IN THE EARLY NEOLITHIC OF NORTHWESTERN ROMANIA

Author: Archaeologist Astalos, Ciprian - Satu Mare County Museum (Presenting author)
Keywords: bracelets, Neolithic, Romania
Presentation Preference: Oral

There are numerous studies analyzing stone ornaments in the Neolithic but most concentrate on Western Europe while many regions of Eastern Europe still lack such kind of investigations. In my study, I will present some discoveries from an Early Neolithic site from northwestern Romania. The site is dated, from a culture-historical perspective, to the late phase of the Starčevo - Criș - Körös (SCK) cultural complex and is placed at the northern periphery of the SCK area. The region is situated at the contact between two radically different environments, the Great Hungarian Plain and the western fringes of the Carpathian Mountains. The site of Călinești-Oaș (Satu Mare county, northwestern Romania) was excavated between 1999 and 2001 and yielded an impressive amount of chipped stone artefacts, remains of a workshop for knapping local limnic silicites. In this context, fragmentary bracelets, and also pre-forms and waste products of bracelet production had been found. They were made of clayey marlstone, a soft and light rock, grey in colour, quite easy to work. All data point to the conclusion that a workshop specialized in bracelet production functioned at Călinești-Oaș along the one specialized in the making of chipped stone tools. A quarry was not yet identified, the raw materials being brought to the site as rough-outs. The site is rather marginal but the proximity to raw material sources made the place attractive for people. I will present a technological analysis of the bracelet remains, identifying the main steps of the chaîne opératoire of their production. Issues regarding the raw material and results of the analysis with a portable XRF will be presented. Finally, I will evaluate the place of the Călinești-Oaș bracelet workshop in the cultural context of the early Neolithic of Eastern Europe.

03 THE SMALLEST ORNAMENTS. SOME APPROACHES TO THE STUDY OF EARLY IRON AGE KAOLIN BEADS FOUND IN NORTH-THRACIAN GRAVES.

Author: PhD Mandescu, Dragos - Arges County Museum (Presenting author)
Co-Author: PhD Mihalache, Maria - Institute for Nuclear Research, Pitesti; PhD Stanculescu, Ioana - Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering
Keywords: Beads, Kaoline, Thracians
Presentation Preference: Poster

Recent excavations in the necropolis at Valea Stânii (Arges County, Romania) led to the attestation of the kaolin beads as grave good, for the first time South of the Carpathians, in the north-Thracian culture at the end of the Iron Age (7^{th}-6^{th} centuries BC). The poster displays the results of parallel investigations on some samples from the grave no. 1 at Valea Stânii, delivered by „Horia Hulubei" IFIN Magurele and ICN Pitesti laboratories. Vibrational spectroscopy methods give information on functional groups/chemical bonds of the samples. The following Fourier Transform (FT) techniques were used for investigations: micro DRIFT (Diffuse Reflectance Infrared), KBr pellet transmission FTIR and FT-Raman. In the FTIR spectra, silicate SiO2 bands of 1088, 796, 779, 694 and 465 cm-1 helped us to conclude that the material used for beads was kaolin. In the FT-Raman spectra the SiO2 bands of 466 and 129 cm-1 were identified. A bead fragment bead has been examined by Scanning Electron Microscopy and Energy Dispersion X-Ray Spectrometry. Characterization of the fracture surface of archaeological artifact shows the presence of small particles with different shapes and morphology. Ones are crystallites with sharp edges that displayed a pattern with parallel lines representing the crystalline plans of particle, others are areas containing small particles or bigger particles rounded by cracks. EDS analysis of a large field proved the presence of Oxygen, Silicon, Aluminum as main chemical elements and also the presence of Iron, Potassium, Titanium, Magnesium and Calcium. EDS mapping of these elements demonstrated the presence of oxygen and silicon in isolated areas while other elements are absent and the rest of surface are composed from all

elements. The EDS multi-point analysis determined chemical composition that shows the presence of complex silicates formed with Aluminum, Iron, Potassium, Titanium and Calcium.

04 A NEW PROVENANCING TOOL: "NON-INVASIVE" PORTABLE LASER ABLATION SAMPLING FOR SUBSEQUENT TRACE ELEMENT AND MULTI-ISOTOPE ANALYSES.

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Co-Author: Dr. Koornneef, Janne - Vrije Universiteit Amsterdam; Prof. Davies, Gareth - Vrije Universiteit Amsterdam
Keywords: Provenance, laser, isotopes
Presentation Preference: Oral

Chemical fingerprinting of archaeological materials can determine how, when and where objects were made and hence their provenance and potentially authenticity. If public and/or private institutions grant access to study artefacts, generally material cannot be transported, nor is bulk destructive analysis permitted. As a consequence, portable non-destructive instrumentation and analysis is required. Commercially available non-destructive portable analytical techniques such as portable XRF or LIBS have poor analytical accuracy and precision and are not capable of determining combined trace elements and isotope compositions. The techniques are therefore generally not discriminatory enough for provenancing the source of most raw geological materials that comprise archaeological artefacts. To understand artefact mobility networks, a new integrated trace element and multi-isotope provenancing methodology is presented that uses a portable "non-invasive" laser ablation sampling technique combined with lab-based trace element and Sr and Nd isotope analyses. The portable instrument consists of a pulsed solid state laser (532 nm), an optical fiber attached to an optical head, a sampling filter mount and a membrane pump. The system uses inert filters to collect material in museums for return to the laboratory for low blank (pg) geochemical procedures. Ablation pits approximately 60 or 120 micrometer in width and depth remove microgram amounts of material and therefore the integrity of the object is preserved. Following dissolution, trace element ratios are determined by inductively coupled plasma mass spectrometry (ICPMS) and combined Sr-Nd isotopes by thermal ionisation mass spectrometry (TIMS) equipped with 10^13 Ohm resistors. Reproducibility and accuracy of the techniques were evaluated by multiple analyses of reference glass BHVO-2 and natural jadeitite. The methods allow precise analysis of sub-ng amounts of Sr-Nd, which coupled with the trace element data, provides highly effective multi-variant discrimination for material provenance and authenticity verification.

05 ENNOBLEMENT OR IMITATION? A CASE OF THE FIBULAE FROM THE WIELBARK CULTURE CEMETERY IN MAŁE CZYSTE (CHEŁMNO LAND, POLAND)

Author: PhD student Pronobis, Maria - Institute of Archaeology Nicolaus Copernicus University (Presenting author)
Co-Author: Dr Bokiniec, Ewa - Institute of Archaeology Nicolaus Copernicus University; PhD student Kowalski, Łukasz - Institute of Archaeology Nicolaus Copernicus University; Dr eng. Garbacz-Klempka, Aldona - AGH University of Science and Technology
Keywords: Imitation, fibulae,ennoblement
Presentation Preference: Poster

This study characterizes a collection of 20 fibulae recovered from the Wielbark culture cemetery in Małe Czyste (Chełmno land, Poland). The cemetery is dated from the 2nd century BC to the 2nd century AD.
The collection from Małe Czyste has been described in terms of metal structure and composition. The investigations were made by means of the energy dispersive X-ray fluorescence spectroscopy (ED-XRF), scanning electron microscopy (SEM) coupled with an energy dispersive X-ray analysis system (EDS), optical microscopy (OM) and X-ray radiography (X-ray). The fibulae were also archaeologically evaluated by means of typological and comparative analyses.
It has been established that the Wielbark metalworkers were familiar with imitating luxury metal goods as it is reflected through the manner they had selected a raw-material and techniques for manufacturing the fibulae. It is not only a high-skill of the local metalworkers that is visible in the collection from Małe Czyste but it is also indicative of a strong need of the Wielbark culture communities for luxury metal goods or their imitations at least. Perhaps the local elites from the Roman period were interested in emphasizing their economical and social position by wearing and hoarding luxury ornaments such as the fibulae from Małe Czyste.

06 BENEATH THE STRINGS: EXAMINING ETHNOGRAPHIC BODY ORNAMENTS THROUGH MICROWEAR ANALYSIS

Author: Guzzo Falci, Catarina - Leiden University (Presenting author)
Co-Author: Prof. dr. Van Gijn, Annelou - Leiden University; Prof. dr. Hofman, Corinne - Leiden University
Keywords: Ornaments, Microwear, Ethnographic
Presentation Preference: Oral

Ornaments recovered from archaeological sites have been the subject of considerable research worldwide. Microwear analysis is one of the main methods applied to their study, as it provides insights on production techniques, use and systems of attachment. However, there is an interpretation limit in our ability to reconstruct systems of attachment of ornaments. This is because long-term use-wear is difficult to replicate in experiments, hampering the formation of reference collections. The systematic research of ethnographic collections can help us bridge this gap in interpretation, by providing direct comparison for studying archaeological beads. In this study, we apply microwear analysis to composite ethnographic ornaments from lowland South America. Necklaces, bands, lip- and ear-plugs, housed at the Musée du quai Branly (Paris), were analysed to provide insight on the types of attachment systems available and use-wear development. These pieces often involve multiple components, such as shell, teeth, bone, seeds, nuts, and feathers, attached through different string configurations. The goal is to investigate whether the interaction between the different contact materials with each other and with an individual's body produces characteristic traces on the individual components. The combined use of different microscopes, alongside the study of the recorded history of each category of composite ornament, can provide a better understanding of the biographies of ornaments and the formation of the corresponding wear traces. In the future, the results of this research can be applied as reference for more effectively interpreting the use of archaeological ornaments by past societies.

07 FORAGER ORNAMENTAL TRADITIONS IN THE EASTERN ADRIATIC THROUGH THE LENS OF USE-WEAR AND RESIDUE ANALYSES

Author: Dr Cristiani, Emanuela - La Sapienza University of Rome (Presenting author)
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Keywords: Ornaments, Mesolithic, Adriatic
Presentation Preference: Oral

Over the last three decades, archaeologists have widely explored the evolutionary implications of the use of bodily adornment in ancient populations and the key role of ornaments such as beads, pendants, appliqués and pigments for understanding social and cultural changes in the past. Recent archaeological investigations in the Eastern Adriatic region, and particularly at the site of Vlakno cave in the island of Dugi Otok (Croatia) have yielded a rich and unique repertoire of organic body adornments made out of animal teeth, marine and freshwater gastropods and shells, which have been ascribed to the end of the Palaeolithic and Mesolithic. The analysis of technological, use-wear and residues preserved on the archaeological ornaments enabled us to define how such organic materials were conceived and used by the foragers of the island to construct social identity. When archaeometric and contextual data related to Vlakno ornaments are discussed in a wider geo-chronological perspective, aspects of continuity as well as variability in manufacturing techniques and in the selection of raw materials suggest body ornaments might have played a key role in expressing different Mesolithic cultural traditions across the Easter Adriatic and the central Balkan regions.

08 MESOLITHIC ADORNMENTS IN THE IRON GATES

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Keywords: Mesolithic, adornments, burials
Presentation Preference: Oral

The Iron Gates section of the Danube has yielded ca. 425 Mesolithic and Early Neolithic burials from 15 sites, with 14C dates ranging from ca. 12,500 to ca. 7500 cal BC. Some of the Late Mesolithic burials at Schela Cladovei and Ostrovul Corbului contain a specific category of grave goods represented by shell beads and/or cyprinid teeth appliqués. Such burials were dated to ca. 9000- 7600 cal BC. Three of the most representative burials (two from Schela Cladovei and one from Ostrovul Corbului) are the focus of the present study, to establish whether such adornments were created exclusively for the afterlife or for daily wear as well. They were made from the shells of several gastropod taxa (Lithoglyphus sp., Tritia sp. and Columbella rustica), as well as the pharyngeal teeth of cyprinids. While the Lithoglyphus shells were perforated and fixed in composed adornments, the Columbella shells were perforated and sewn onto clothes/leather items and the Tritia neritea shells were processed in a very particular way - removing the spire and upper part of the body whorl to facilitate the attachment to clothing in the manner of appliqués. No technological intervention was noted on the cyprinid teeth. These were sewn individually onto leather, with a thread coated with an adhesive substance. The varying degrees of use-wear suggest that such ornaments were not created exclusively for the afterlife, but were probably used during a large part of an individual's lifetime, with broken or missing pieces replaced when necessary.

Acknowledgment
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09 FROM RAW MATERIAL TO FINAL PRODUCTS. EVIDENCES OF BEADS MANUFACTURE IN THE EARLY NEOLITHIC SITE OF LA DRAGA (NE IBERIA)

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Keywords: Neolithic, Draga, beads
Presentation Preference: Oral

La Draga is an early Neolithic (ca. 5300-4900 cal BC) pile-dwelling settlement located at the eastern shore of Lake Banyoles (north-eastern of Iberia). Since its discovery in 1990, 979m2 have been excavated of an estimated surface around 10000m2. Along this surface many evidences attest the structuration of the inhabited space in activity areas that can be identified by means of the spatial analysis of remains, evidences and structures. Some of these structures were built on wood and have been partially preserved due to the waterlogged conditions of the site.
Many ornaments -bracelets, rings, pendants and notably beads- have been recovered in this settlement. The raw materials used in their elaboration are mainly mollusc shells but also include bones, antler, fruit seeds and minerals. Mollusc were acquired on the Mediterranean coast, currently located about 35-40km to the east. We present here the findings in the so called Sector A in La Draga site, where a cluster of evidences related to the manufacture of beads have been attested. These evidences are composed not only by shell remains in several stages of transformation –from raw material to final products- but also include some tools used on their preparation, transformation and finishing. Use-wear with regard to the production of bead blanks and their grooving, drilling and polishing are shown. All together these evidences allow us to propose the existence of a kind of domestic workshop focused on the production of ornaments.

10 EXPERIMENTAL APPROACH OF SHELL BEAD MANUFACTURING TECHNIQUES DURING THE EPIGRAVETTIAN : EFFICIENCY AND TRACES VARIABILITY

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Keywords: Shell ornaments, Epigravettian
Presentation Preference: Poster

Throughout the Upper Palaeolithic, shell beads experienced few modifications as the only manufacturing stage is reduced to the perforation of the shell. In epigravettian contexts, whereas raw material identification is systematic, the characterisation of perforation techniques is still rarely considered. The few studies which take in account this aspect show that technical choices vary much more than raw material choices ; highlighting the importance of technical choices in cultural differentiation between epigravettian groups.
It seems therefore necessary today to characterise precisely the traces specific to each perforation technique to define the technical choices adopted by different prehistoric groups. Nevertheless, some factors might modify the traces and efficiency of the techniques. The shell thickness can vary according to the species and to environmental conditions, which can change significantly from one area to another within the same body of water.
Thus we made an experimentation using three species, commonly discovered in epigravettian contexts: Tritia pellucida, Tritia neritea and Columbella rustica. Eight perforations (direct and indirect percussion, pressure, sawing, manual rotation, scratching, grinding, and inside-out bipolar percussion techniques were tested to identify their traces and variability depending on the species tested and the origin of the shell.
The drills used during the experimentation were replica of drills discovered in the epigravettian site of Riparo Tagliente. This site was chosen because one of the levels (level 13a alfa) revealed lithic drills and perfored shells (including 90% of Tritia neritea). This association could be interpreted as traces of shell bead manufacturing activity.
These experimentations and the traceological analysis of the archaeological shells and drills, should enable us to understand the link between the techniques involved, the species exploited and the visible traces on shells.

11 CYLINDRICAL BONE BEADS OF THE EBA MIERZANOWICE CULTURE OF POLAND: MANUFACTURE-USE-MEANING STUDIED WITH IMAGING AND MORPHOMETRIC METHODS

Author: MA Winnicka, Kinga - Institute of Archaeology, University of Wrocław, Poland (Presenting author)
Keywords: beads, bone, burial
Presentation Preference: Oral

Cylindrical and discoidal beads are a common occurrence in burials associated with the epi-Corded Ware cultural cycle of the circum-Carpathian region. Beads analysed for this study originate from two sites in Poland: Kichary Nowe and Krzyżanowice Dolne. The first assemblage is fairly small – with only 19 beads, whereas the other is large – with 617 whole beads and many fragments. The beads from Kichary Nowe have been analysed previously by the author (along with other bone beads – barrel- and tube-shaped): it was possible to distinguish the raw material (antler), propose a plausible chain of operations in regard to antler working and identify use-wear traces indicating that some of the beads had been worn prior to deposition in the grave. In this study I would like to re-evaluate the findings and present the results of the analyses conducted on the Krzyżanowice Dolne assemblage. Three imaging methods have been employed: microscopic observations and measurements (by metallographic and stereomicroscopes), SEM analysis and microCT scanning (pilot study); as well as morphometric analysis investigating e.g. length/diameter ratios of beads and statistical analysis of generated data. In my presentation I intend to substantiate the hypothesis that some assemblages of beads were made solely for the purpose of burying them with the dead, which – combined with contextual information – is informative of burial practices of the Mierzanowice culture people. I also argue that the use of non-destructive imaging and morphometrics for the study of bone bead technology and use was beneficial in the case of this large assemblage, and in my presentation I intend to discuss the advantages of this approach.

12 SHELL ORNAMENTS FROM COVA FORADADA (MEDITERRANEAN FAÇADE OF IBERIAN PENINSULA)

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Keywords: Foradada, ornaments, shell
Presentation Preference: Oral

Cova Foradada is an archaeological site situated in the Mediterranean coast of the Iberian Peninsula (Xàbia, Marina Alta, Spain). The site is in a small cave located in the cliff of Sant Antoni cape, nowadays at 40 MASL. The settlement was occupied discontinuously in different periods since the Early Upper Paleolithic (33.810±312 cal BP) to recent times and it seems that it was not inhabited during long periods of time. The stratigraphic sequence shows punctual moments of occupation of the cave which occur far apart from one another in time. This fact made possible the good conservation of the archaeological objects (Casabó, 1997, 2014).
Shell ornaments (c. 25 beads and pendants) have been recovered from levels V, II (corresponding to Aurignacian –33810±312- 31281±468 Cal BP–) and III (Mesolithic/early Neolithic –7010±172 Cal BP–). Most of the shells come from the most ancient levels.
An integrated approach combining malacological and techno-functional analyses, was carried out on the whole assemblage. Taxonomic classification and biometric analyses allowed the understanding of shell exploitation strategies during all the occupation sequence of the site. The microscopic observation of technical and use-wear marks allowed us to reconstruct the perforation manufacturing process and to identify the suspension systems of the beads.
Gastropods (freshwater/low salinity and marine) are the main taxon used to manufacture the ornaments. Among them, Naticidae Guilding, 1834 and Theodoxus fluviatilis (Linnaeus, 1758) are very abundant. Bivalves are less represented. Moreover, some individuals present ochre.

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13 STUDYING ORNAMENTS FROM THE EPIGRAVETTIAN AND MESOLITHIC LAYERS OF VLAKNO CAVE, CROATIA: SOME PRELIMINARY RESULTS

Author: Dr Radović, Siniša - Institute for Quaternary Palaeontology and Geology, Croatian Academy of Sciences and Arts, Zagreb
Co-Author: Dr Cvitkušić, Barbara - Institute for Anthropological Research, Zagreb; Dr Vitezović, Selena - Institute of Archaeology, Belgrade (Presenting author); Dr Vujević, Dario - Department of Archaeology, University of Zadar, Zadar
Keywords: ornaments, molluscs, Adriatic
Presentation Preference: Oral

The site of Vlakno is a rock shelter situated on the island of Dugi otok in the Adriatic sea, Croatia. Systematic excavations that are still ongoing revealed rich deposits from the Mesolithic and Palaeolithic period. This site is one of the richest sites on the Eastern Adriatic coast with the finds of ornamental assemblage from the Mesolithic and Epigravettian period. Almost 500 specimens of body ornaments, have been discovered so far, along with numerous unperforated marine gastropods species. According to the raw material, ornamental assemblage can be divided into three groups: marine gastropods, bivalves and scaphopoda; freshwater gastropods; terrestrial mammals (teeth and bones). Long sequence of the site's use may provide information on long-term variations in raw materials selection and technology. Furthermore, careful analysis may give insight into symbolic value of certain ornaments, as well as on possible routes of trade and exchange. On-going multidisciplinary studies include analyses of zooarchaeological origin of the raw material, technological analysis of manufacturing techniques and macro- and microscopic analyses of usewear traces. In this paper preliminary results will be presented, in particular analyses of technological procedures; advantages and problems of use of diverse magnification will be discussed.

14 RE-ANALYSING SHELL ORNAMENTS - CASE STUDIES ON NEOLITHIC AND EARLY BRONZE AGE BURIALS IN POLAND

Author: Dr Sobkowiak-Tabaka, Iwona - Institute of Archaeology and Ethnology Polish Academy of Sciences
Co-Author: Dr Kurzawska, Aldona - Institute of Archaeology and Ethnology Polish Academy of Sciences (Presenting author); Dr Pyzewicz, Katarzyna - Institute of Archaeology Adam Mickiewicz University; Dr Mrozek-Wysocka, Małgorzata - Institute of Geology Adam Mickiewicz University; Szczepaniak, Katarzyna - Museum of the Earth, Polish Academy of Sciences
Keywords: shells, burials, prehistoric
Presentation Preference: Oral

Shell ornaments found in Poland, however rich and spectacular especially in the burials of the Neolithic and Early Bronze Age societies, until now did not receive enough attention. They were described mainly in terms of types they represent (necklaces, belts or bracelets), burials that they differentiated (female vs. male); eventually they were used as markers of higher social status of the deceased. Moreover many of those precious ornaments were misidentified in the past which directly influenced archaeological interpretation. Revealing their proper "names" and origin was our initial task that led us to complex analysis of shell artefacts in a specific context of burials. There was a need for proper methodology in treatment and analysis as there were no proper studies of this category of artefacts in Poland.
Our studies revealed that shells are a kind of special material that preserve various traces of the past from the burial environment. Behind the shell ornaments it is always much more than we could initially see. In the presentation we would like to introduce results from methods applied in the studies of shell ornaments found in Poland: archaeomalacological, paleontological, microwear, residue, isotopic and SEM with EDS. We would like to present how multiple analyses of shell ornaments influenced our knowledge on the burial context, shell ornaments and changed our perception of Neolithic and Early Bronze Age burials.

15 ARCHAEOMETRY OF SHELL AND STONE ORNAMENTS FROM A MIDDLE NEOLITHIC BURIAL OF CUCCURU IS ARRIUS, CABRAS (SARDINIA, ITALY)

Author: Puddu, Valentina - University of Cagliari; Laboratory of Sardinian Antiquities and Paleoethnology; Department of History, Cultural Heritage and Territory (Presenting author)
Co-Author: De Giudici, Giovanni - University of Cagliari; Department of Chemical and Geological Science; Lugliè, Carlo - University of Cagliari; Laboratory of Sardinian Antiquities and Paleoethnology; Department of History, Cultural Heritage and Territory
Keywords: Archaeometry, ornaments, neolithic
Presentation Preference: Poster

Personal ornaments are one of the main components of Middle Neolithic burials in Sardinia. Beads, pendants and bracelets made by seashells and stone of various forms and colours were commonly used since this period.
Actually, the necropolis of Cuccuru is Arrius is the oldest attested in Sardinian Neolithic. Archaeological excavations carried out in the late '70s led to the discovery of at least 19 graves, in general assigned to the Bonu Ighinu culture and dated to the Vth millennium BC. Besides some simple pit-graves, 13 were hypogea carved into the sandstone rocky bank with the entrance from a vertical shaft. In the chambers, bodies were laid on their left side in a crouched-up position, associated with rich burial goods including pottery vessels, stone and bone tools, as well as anthropomorphic stone figurines. Individuals were also adorned with small chlorite circular beads, Dentalium shells and, seldom, with coral or bone pendants.
This paper makes part of an ongoing study on unpublished shell (Cipraea and Dentalium) and stone (chlorite and hemimorphite) ornaments from the 437 hypogeum. In order to characterize the raw material exploited for stone-beds making, different techniques were applied, including optical microscopy at different magnifications, SEM imaging, and SEM-EDS. Distinct analytical methods ensured an assessment of the microstructure and mineral composition of the raw materials, of the changes in artefacts shapes, manufacturing techniques and use wear patterns. From this specific case study, this work aims to provide a future reference to the ornaments found in the whole necropolis as both to the raw material exploitation and to the respective technical tradition in the manufacture.

311 OBJECTS & IMAGES: MATERIALITY OF LIVED RELIGION IN THE CLASSICAL WORLD

Theme: 6. Interpreting the archaeological record
Author: Berg, Ria (Finland) - University of Tampere
Co-Author(s): Kuivalainen, Ilkka (Finland) - University of HelsinkiCoralini, Antonella (Italy) - University of Bologna
Keywords: materiality, lived religion, iconography
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

In this session central themes are materiality of religious artefacts
and their representations in the "lived religion" of the Classical

world. The particular questions that will be posed to experts of
ancient iconography, religion and material culture are: how are
objects and instruments belonging to various religious cults
represented in the wall-painting of ancient habitations? As artefacts, how do they relate with other everyday utensils in domestic contexts? How are ritual and normal everyday domestic practices that involve the use of such utensils intertwined in a framework of housekeeping and lived religion? How do these images of such objects travel from one culture to another, universalized in a pictorial and material koinè and how are they applied in new, different and distant cultural
contexts?

01 POMPEI: L'IMMAGINARIO URBANO PERDUTO DI APOLLO E ATENA

Author: Prof. Osanna, Massimo - Soprintendenza Pompei
Co-Author: Prof. Rescigno, Carlo - Università degli studi della Campania (Presenting author)
Keywords: Pompeii, Apollo, Athene
Presentation Preference: Oral

Partendo dal contesto pompeiano, il contributo si incentrerà sui santuari di Apollo e Atena mettendone a fuoco le pratiche rituali documentate dai testimoni archeologici. Si passerà quindi in rassegna il repertorio delle immagini restituito dai santuari, per quello del Foro Triangolare a partire dalla ricca decorazione architettonica, per quello di Apollo centrando l'attenzione sul set di sculture in bronzo e marmo restituito dagli scavi borbonici e sul ciclo pittorico del portico centrato su temi iliadici.
Nella seconda parte del contributo si analizzerà l'eventuale diffusione e pregnanza semantica di immagini e temi rituali simili nello spazio urbano pompeiano aprendo la discussione su trasmissione di temi e loro progressivi riutilizzi alla ricerca di un immaginario urbano perduto di Apollo e Atena.

02 SACRED FIGURES, OBJECTS AND PLACES: HERCULES IN THE DOMESTIC SPHERE.

Author: PROF. ANTONELLA, CORALINI - University of BOLOGNA (Presenting author)
Keywords: HERCULES, CLASSICAL WORLD
Presentation Preference: Oral

What turns an image of divine into one of worship? What are its minimum requirements in the ancient world? What is the support and the context's role? Can we recognize common coordinates? Or should the test be conducted case-by-case, ad hoc? The contribution tries to answer to these questions, selecting as case studies the domestic scene and the subject of Hercules. Twenty years after the beginning of her researches about Hercules domesticus, A. Coralini provides a critical analysis of the results of her work, in the light of the more recent progress in studies.

03 PAINTED SCULPTURED BACCHUS IN POMPEII

Author: Kuivalainen, Ilkka - University of Helsinki (Presenting author)
Keywords: Pompeii Bacchus wall-paintings
Presentation Preference: Oral

It is well known that Dionysiac art can be seen all around Pompeii. God himself, known mainly under Roman name Liber or sometimes Bacchus among the ancient Pompeians, was most commonly depicted according to Hellenistic iconographic models. Statues of Bacchus were displayed mainly in gardens, but some were also found indoors. I will concentrate on wall-paintings that depict sculptured Bacchus. These painted statues form different groups. Firstly there is division in age of the god: Bacchus is depicted either as child, adolescent or barbed figure. Children and youths are quite rare compared to the types of barbed Bacchi, which represent archaistic models. Herms are a group of their own. They are either youths, sometimes very feminine ones, or barbed, or both.
Secondly I will look into the context. The painted statues are depicted in various parts of wall-paintings. There has been influence of sculpture in upper zones of wall-paintings, but painted statues that I use are mostly clear statues within picture-panels, not only part of the decorative scheme. Some form part in sacral landscapes or garden paintings. These may be hard to identify because of the artistic style of paintings or simply the small size of them and Dionysiac themes can be visible without statues of Bacchus himself. Third point comes from the very precise combinations in picture-panels. There can be several Bacchi in one painting e.g. a painted statue stands behind a youthful painted living Bacchus. Fourthly comes the meaning of painted sculptured Bacchus. Did these representations mean something religious to their owners? There are cult scenes as well. What was the link between real statues and these painted statues? These will be linked to the question of Pompeian Bacchus and its origins.

04 THE TELAMONS OF THE FORUM BATHS IN POMPEII AS SYMBOLS OF MASCULINE SELF-CONTROL AND THE FERTILE FORCE OF THE WILD

Author: Mr. Hakanen, Ville - University of Helsinki (Presenting author)
Keywords: baths, sculpture, masculinity
Presentation Preference: Oral

The walls of the tepidarium of the Forum Baths in Pompeii are lined by a row of terracotta telamons from the first phase of the baths around 80 B.C.E. making them the oldest example of Roman bath decoration preserved in situ. They represent muscular bearded men crowned with cylindrical headdresses. Most of the telamons wear rustic loincloths but 11 are naked and their penises are tied up using a device known as a kynodesme in Greek.

In this paper I argue that the telamons were a perfect ornament for their environment. Roman baths were a locus of symbolic production between barbarian and civilized. On the one hand, they maintained order by imposing self-control. On the other hand they were an unstable, dangerous environment of transition and transformation. The telamons were both apotropaic guardians needed in the transitory space and personifications of the marginal representing a tension between rational and irrational, body and soul, earth and sky, life and death, mortality and immortality. They reflected the special role of baths in the formation of the civilized man by staging the existential challenge of controlling the

irrational, taming the wild. But they also celebrated the power of that force when controlled – parallel to the concept of the baths itself, where water and fire were "tamed" to serve the common good.

Moreover in the tomb-like space of the tepidarium the chthonic figures alluded to a heroon, recalling the community's valuation of heroism as the ideal form of manliness and a way to immortality. Parallel telamons from the baths at Fregellae demonstrate that some of these thematics belonged to a longer tradition in bath decorations. Their continuation can be seen in the figure of Hercules, the most popular mythological figure in imperial bath decorations and the ultimate paragon of heroic masculinity.

05 THE MAGIC OF THE MUNDANE. WOMEN AND VERSATILE OBJECTS: IN THE GREAT FRESCO OF THE VILLA OF MYSTERIES, POMPEII

Author: Professor Dr Lindstrøm, Torill Christine - University of Bergen (Presenting author)
Keywords: Dionysiacfresco, versatile, magical
Presentation Preference: Oral

The Great Fresco in Villa of the Mysteries (Villa dei Misteri), Pompeii, Italy, is perhaps the most famous Fresco from antiquity. It was painted in the late Roman Republic, and covers all four walls of a dining room (triclinium). The content of the Fresco has been interpreted in various ways, with religious or semi-religious interpretations being the most common. Some of the differences in interpretations may be due to the fact that many of the Fresco's objects are ambiguous: they can be seen to belong both to the sphere of everyday domestic practices, and to the sphere of ritual religious practices. Based on an extensive data-collecting from the Fresco and a meticulous analysis of all its objects, I will present an overview of the objects, identify their material and functional ambiguity, and analyze their functions in a (potential) Dionysiac cult/society (thiasos) within a household. In particular, the magic properties and double functions in lived religion, of some everyday objects, will be elaborated. Explanations presented will partly be based on the Hellenistic contextual, contemporary "cosmopolitan" cultural traditions, and partly based on psychological perspectives.

06 A SACRED UNION? REFLECTIONS ON THE FUNCTION, REPRESENTATION, AND MEANING OF THE COUPLE 'JUG/PATERA' IN THE ROMAN IMPERIAL AGE

Author: Dr. Berg, Ria - University of Tampere (Presenting author)
Keywords: vessels, sacrifice, Serapis
Presentation Preference: Oral

Two bronze vessels, the jug with trilobed mouth and the patera with a handle ending in a ram-head, functional both in sacral and domestic ablutions, form a fixed couple well affirmed and discussed first by Nuber (1972), and later by Siebert (1999), among others. In this paper, some Pompeian find contexts and pictorial representations of such vessels are analysed, in order to better understand their particular role in Roman cult practice. Among the bronze vessels found in Pompeian houses destroyed by Vesuvius in AD 79, the jug and the patera often appear together and are coupled by their decoration. They are also in some cases found together with small pedestals intended to raise them from the ground. Alternatively, they seem to have been meant to be deposited piled up, the jug inside the patera. How are these exceptional modes to present and deposit the two vessels, and their distinctive decoration, related with their practical or sacrificial significance? How can both sacral and mundane use of such vases be compatible in the framework of the inventory of objects of a Roman household?
Such a pair of vessels is represented also in a mosaic floor from the Domus belonging to the complex of the Ostian Serapeum. This raises further question about the position of such instrumenta sacra on the religious map of the Greco-Roman world – in what way are sacrificial vessels, in general, and this couple, in particular, used to create or communicate a foreign/exotic or domestic/traditional nature of a cult practice?

07 WHAT'S IN A VASE? PROTOTYPES, ICONOGRAPHY AND SYMBOLISM OF ROMAN CINERARY VASES IN EGYPTIAN STONE.

Author: Dr Perna, Simona - British School at Rome (member)/Independent Researcher (Presenting author)
Keywords: funerary, iconography, symbolism
Presentation Preference: Oral

From the late first century BC cinerary urns in coloured stone began to appear in Roman burials. A vase-shape with a smooth profile and the precious materials – e.g. Egyptian alabaster and purple porphyry – set these artefacts aside from other known types of Roman ash containers. Previous studies highlighted these urns' heterogeneous shapes which appeared inconsistent and random. However, my study highlighted that 63 urns out of 116 currently extant examples present a recurrent shape. This is made of a double-handled hemispherical body resting on a short foot with lid and piriform finial. Resembling a (modern) soup bowl, I labelled this shape "tureen".
The "atypical" tureen shape appears as a "mixture" of elements borrowed from Archaic, Classical and Hellenistic metal and pottery vessels, some imbued with strong symbolic connotations, such as the series of bronze kettles/lebetes that since the Orientalizing period were entangled in complex cultic and ritual functions, funerary and non, across the Mediterranean. Without implying a direct relationship or historical continuity with the past meaning and uses of these vessels, I suggest that tureen iconography derived from these objects. Indeed, similar vessels, closely alike to the tureens, duly featured in 2nd-Style frescoes and mosaics but became more frequent in the 3rd-Style sacro-idyllic scenes from the Augustan period around which time they came into use as funerary urns. I argue that this is not merely a coincidence.
This paper discusses the dynamics that led to the creation of such symbolically charged a shape for a funerary urn. The tureen, with its hybrid ancestry of archaic containers, is the synthesis of meaningful iconographic prototypes. It represents a material syntax that articulated the intention to transpose an iconic shape with an "aura" of sacredness into an imported stone so to appear apt to a Roman ritual context.

08 SACRA PRIVATA IN CENTRAL ITALY. NEW DATA FROM AN ARCHAEOLOGICAL RESEARCH

Author: Post Doc Fellow Bassani, Maddalena - University of Padova Italy (Presenting author)
Keywords: cult, house, religion
Presentation Preference: Oral

In recent years the studies dedicated to the domestic religion in the Roman world have proposed new approaches and new methods for interpreting the several indicators related to private cults. In fact, it is clearly necessary to consider not only the paintings or the statuettes of the most famous family deities, the Lares, already well known and studied, but also all other ritual tools, cult indicators and divine images attested in the different parts of the house.
This contribution aims at presenting the results of a research performed in the Roman houses of central Roman Italy (examples from the Marche, Abruzzo, Molise, Umbria, Toscana regions), in which the evidence of both structural and material cult 'markers' is clear. The archaeological data, juxtaposed with the ancient literary and epigraphic evidence, can offer an interesting and manifold picture of the private ceremonies performed in the houses, in which deities and worshippers were involved in mutual relationships, both in daily rituals, in calendar festivities and in personal anniversaries.
Finally, some reflections can be offered on the possible difference between types of cult objects found in the sacred spaces of urban dwellings and those from countryside residences too, in order to understand whether there is a specificity to cult objects in relation to the divinities invoked to watch over the house, and to the type of economic activity performed by the owner of the house. The data identified in the Roman houses of central Italy are also compared with some examples from the imperial provinces.

09 EVERYDAY RITUALS: CULTS, HOMES AND WOMEN IN WESTERN SICILY, 8TH – 5TH CENTURIES BC)

Author: Ferrer Martin, Meritxell - Universitat Pompeu Fabra (Presenting author)
Keywords: Sicily, ritual, domesticity,
Presentation Preference: Oral

Despite the importance of ritual and religion studies in Mediterranean archaeology since the beginning of the discipline, domestic ritual practices have traditionally been belittled. Most archaeological narratives related to rituality and religion have traditionally focused on official institutions, monumental architecture, public celebrations and religious technocrats. Furthermore, these topics are usually associated with power and, under this traditional view, almost exclusively with the male sphere. As a result of this perspective of analysis, little attention has been paid to ritual practices in the domestic realm. These practices were mostly carried out by some of the women of the house as they performed other everyday tasks, such as cooking and weaving.

Through the study of domestic ritual practices in three different western Sicilian contexts –Greek (Himera), Phoenician (Mozia) and local (Monte Polizzo and Monte Maranfusa)– the main aim of this paper is to recover the importance that these "forgotten" daily ritual practices for the development of the household and the community they took place in. The study of ritual practices that were carried out simultaneously with some domestic activities strongly associated with the feminine sphere enables us to retrieve the agency of some Sicilian women, highlighting their centrality and importance in the maintenance of their own homes and, by extension, their communities: Greek, Phoenician or local.

10 STATUES OF APHRODITE FROM THE BLACK SEA AREA: BETWEEN ART AND RELIGION

Author: Ms Manea, Elena Brîndusa - Alexandru Ioan Cuza University of Iasi (Presenting author)
Keywords: Aphrodite Statues Colonies
Presentation Preference: Poster

Depictions of the goddess of love have always been a challenge for artists from the ancient times until more recent ones. Either represented clothed, nude or as the mistress of the sea, her image has captivated human creativity and has led to new standards in art. Cultic objects, in particular can be very resourceful in drawing a line between art and religion and in identifying how the two concepts have influenced each other. The objects taken into consideration are small terracotta statues of the goddess found the greek colonies of the Black Sea area, from the archaic times, when the first settlements are established until the roman times.
The aim for this poster presentation is to underline how cultic objects prove to be important for understanding the way that the goddess has been celebrated in the this area, the different meanings that her cult has had throughout the period mentioned above and consequently the connections that we can assume with other parts of the Mediteranean world.
This study will analyse the different styles of the cultic statues, their evolution and the way that artistic interpretations have influenced or not cultic beliefs of the goddess of love in the Black Sea region.

11 NEWLY DISCOVERED AREA SACRA IN PANNONIA SUPERIOR

Author: Dr. Kiss, Peter - Lekri Group Ltd.; Savaria Museum (Presenting author)
Keywords: area sacra, Nymphaeum
Presentation Preference: Poster

A new archaeological site was unearthed in 2016, near Arrabona, Pannonia superior. The site is a very unique cultic place, set in a mystique environment, a pit surrounded by hills, in which a regular, square-shaped, 220 meter (approx. 150 passus) long wall with rounded corners has been erected. In the geometric mean of the large-sized, square-shaped open space a rectangular artificial lake, a catchment basin has been laid out. This lake collected the water from the water source below this installation. At the corners of the square-shaped basin small-sized, rectangular pillars, while in the surrounding thick, square shaped raft foundations built in opus caementitium style were found.
Concerning the artifacts, it is very strange that animal bones and pottery sherds, so typical for Roman rural settlements and farms, are almost completely missing from this site. In the middle of the site, around the lake and building foundations several, very good quality, occasionally brilliant uncirculated coins were found which were dated to the 2nd-4th centuries, but mainly to the reigns of Marcus Aurelius and Caracalla. In the middle of the zone many brooches, thick and thin bronze and iron object fragments as well as lead slags were unearthed.
The excavated finds and features can be ranged into the group of Roman religious cults related to water. We are dealing with a systematically arranged sacred area, where the cultic place around the central basin might have served as a water sanctuary (Nymphaeum), or the lake of Juturna. The foundations could have belonged to sanctuaries with one cella, or to columns, altars and statues, while the bronze fragments were parts of large-sized bronze statutes. The regular surrounding wall, similar to those from military forts, as well as its inner structure designed with high-level architectural exactitude might indicate its military character.

312 MENTORING: ANNUAL RT OF THE EAA'S COMMITTEE ON THE TEACHING AND TRAINING OF ARCHAEOLOGISTS

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author: Karl, Raimund (United Kingdom) - Bangor University
Co-Author(s): Kerr, Sarah (Belgium) - KU Leuven
Keywords: Teaching, Training, Committee, Mentoring
Presentation Preference: Round table

In its 2017 annual round table, the Committee on the Teaching and Training of Archaeologists will look at mentoring, whether of students, junior academics, or more senior staff. Usually describing a (more or less formalised) relationship between a more and a less experienced or knowledgeable person, mentoring is becoming increasingly important as a means of supporting formal and informal training. In this round table, we want to discuss experiences of mentoring arrangements in archaeology, whether in the field, back office, museum, heritage agency, or higher education sector. We particularly invite short presentations on personal experiences with, and best (or indeed worst) practice examples of mentoring in archaeology.

313 EUROPEAN TOWNS AND THEIR ENVIRONMENT IN HIGH DEFINITION: THE 3RD REVOLUTION IN URBAN ARCHAEOLOGY

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Degraeve, Ann (Belgium) - Brussels Regional Public Service
Co-Author(s): Ashby, Steve (United Kingdom) - University of YorkMorris, James (United Kingdom) - University Of Central LancashireGroot, Maaike (Netherlands) - Vrije Universiteit AmsterdamMaltby, Mark (United Kingdom) - Bournemouth UniversitySindbæk, Søren Michael (Denmark) - Aarhus UniversityDevos, Yannick (Belgium) - Université Libre de Bruxelles, Centre de Recherches en Archéologie et PatrimoineNicosia, Cristiano (Italy) - Consulente Libero Professionista in Geoarcheologia e Micromorfologia
Keywords: Medieval archaeology, interdisciplinarity, urban archaeology
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

MERC
Medieval Europe Research Community

The urbanisation process is a major catalyst of cultural developments, also deeply impacting and reshaping the environment. Manifold are the discussions struggling to define the political matrix of these towns, its economical aspects, the role and structure of long-distance interaction, and the degrees to which their demographics, compositions and identities can be said to be distinctively 'urban'.
New technologies, allowing precision dissection of the urban landscape have significantly improved our knowledge. In particular, the ability to undertake archaeoenvironmental, biomolecular, isotopic and metallographic analyses on a scale not previously possible has resulted in the availability of large datasets that have the potential to challenge orthodoxies established on the basis of coarser-grained investigation.
How has this third revolution in archaeological science impacted on our ability to explore big questions about urban development, long-distance communication, and the development of political economy, and how might it illuminate smaller stories about social infrastructure, identity-making, and the everyday lives of urban dwellers? Secondly, how has it modified our view on the urban landscape and its surroundings? A particular focus will also be on the roles of animals within this urban environment. The creation of urban settlements is not possible without the use of animals, and in doing so humans also created new environments for animals to live and thrive in.
In this session, we aim to address all these questions, and to contribute to a new understanding of urban spaces and societies, assembling archaeologists, historians and environmental specialists. We welcome submissions relating to towns across Europe.

01 ENVIRONMENTAL EVIDENCE FROM EARLY URBAN ANTWERP: NEW DATA FROM ARCHAEOLOGY, MICROMORPHOLOGY, MACROFAUNA AND INSECT REMAINS

Author: Mr. Bellens, Tim - Urban Archaeology Department, City of Antwerp (Presenting author)
Co-Author: Prof. Dr. Crabtree, Pam J. - Anthropology Department, Center for the Study of Human Origins, New York University; Institute for the Study of the Ancient World, New York University; Dr. Reilly, Eileen - UCD School of Archaeology, University College Dublin; Dr. Wouters, Barbora - Vrije Universiteit Brussel; Research Foundation Flanders (FWO); University of Aberdeen; Dr. Devos, Yannick - Centre de Recherches en Archéologie et Patrimoine, Université Libre de Bruxelles; Ms. Schryvers, Anne - Urban Archaeology Department, City of Antwerp
Keywords: urban, medieval, environmental
Presentation Preference: Oral

Recent excavations in the medieval burg area in central Antwerp (Belgium) have provided a unique opportunity to explore the archaeology and environmental context of the 8th-10th-century foundations of medieval Antwerp. The multidisciplinary project examines structures and features that are radiocarbon dated to the late 8th-10th century and aim to gain a better understanding of the use of human and environmental resources and the use of space at the dawn of this trade town. Particular attention is given to Antwerp's early transition from rural town to urban trade centre.

02 EUROPEAN TOWNS IN HIGH DEFINITION: MICROMORPHOLOGY AS A GAME CHANGER FOR UNDERSTANDING EARLY MEDIEVAL AND VIKING-AGE URBANISM (HEDEBY, GERMANY)

Author: Dr Wouters, Barbora - Vrije Universiteit Brussel; University of Aberdeen (Presenting author)
Keywords: geoarchaeology, towns, micromorphology
Presentation Preference: Oral

Micromorphology is a geoarchaeological technique with the potential to generate new data and radically improve the understanding of the stratigraphy of archaeological sites. Especially in urban contexts, an optimal grasp of stratigraphical relationships and formation processes is a necessary basis for all subsequent studies. As previous research has shown, micromorphology is able to contribute additional detail to what can be discerned with the naked eye. In the case of towns, this has already been demonstrated extensively for cases that contain so-called dark earths, seemingly unstratified, homogenised deposits. However, micromorphology is also highly suited to the study of other stratigraphical challenges typical of complex urban deposits, such as minute laminations.

With current geoarchaeological methods, it is possible to record and interpret separate phases of each town in more detail, to collect finds accordingly and source dating materials more securely. This approach is illustrated by examples from recent analyses, with a main focus on the Viking-age town of Hedeby. In Hedeby, the well-preserved (waterlogged) settlement phases from the 10th century are very well known. Other phases, however, such as the ones predating and postdating these famous wooden remains, are less understood. These include the pre-town environment, the earliest market activities, the stabling of animals on site, as well as the youngest preserved phase of the settlement. In Hedeby, the micromorphological results from several locations from the settlement area are compared, illustrating how such a spatial resolution is necessary to further grasp the complexity of these urban entities on a high-definition level, as well as on a macroscopic one. In this way, micromorphology in combination with associated geoarchaeological techniques has a strong potential to challenge standing narratives established on the basis of coarser-grained investigation.

03 INTO THE MELTING POT: CULINARY IDENTITIES IN VIKING-AGE ENGLAND

Author: Dr Ashby, Steven - University of York
Co-Author: Professor Craig, Oliver - University of York (Presenting author); Dr Radini, Anita - University of York
Keywords: pottery, food, vikings
Presentation Preference: Oral

This paper will provide interim results from an ongoing project that uses bioarchaeological and artefactual analyses to investigate the role of food and cooking in forging social identities in Viking-Age England. Food is central to the production of identity: particularly so in contexts such as the Viking Age, being characterised by human movement, culture contact, and social and economic transformation. However, in order to access this relationship, it is insufficient to focus on faunal and botanical remains alone; there is a need to investigate the nexus of food and material culture. The explosion of ceramic technology that characterises late-9th and 10th-century England offers significant potential in this regard, while advances in biomolecular research facilitate the collection of high-definition data. Thus, rather than considering the contents of human diet over poorly resolved periods of time, we are now able to reveal the foodstuffs that were stored or prepared in particular vessels, and analyse patterning across time and space.

Through nested analyses of ceramics from urban and rural sites in Viking-Age England, we are investigating whether particular vessel forms may be related to particular functions, foodstuffs, or styles of cooking. Vessel function will be characterised via use-alteration analysis, microscopic analyses of carbonised food crusts, and chemical analysis of absorbed lipid residues, in order to determine if particular forms of pottery were being used selectively in order to store, transport, process, present, or consume particular foodstuffs. Ultimately, we aim to establish the degree to which culinary practice was subject to innovation and regional variation, and how such patterning might relate to the impact of migration, politics, urbanisation and commercial expansion. This paper will introduce the project, and discuss some initial results.

04 LOOKING THROUGH A GLASS ONION? TRACING THE URBAN NETWORK OF THE EARLY MEDIEVAL BEAD MAKER

Author: Professor Dr Sindbæk, Søren - Aarhus University
Co-Author: Ass. Prof. Barfod, Gry - Aarhus University (Presenting author)
Keywords: Glass LA-ICP-MS urbanization
Presentation Preference: Oral

A craftsperson is a mediator in a complex chain of technological and social relations. Urbanization transformed such chains, focusing flows of potentially global reach within the actions of a workshop. This paper presents recent analysis applying LA-ICP-MS to raw glass, cullet, workshop refuse and finished objects from an early eighth century bead-making workshop excavated in the emporium Ribe, Denmark. The results emphasize changes in trans-regional flows of materials and technologies in a highly distributed network of production, linking primary productions centres in the Middle East to secondary and tertiary workshops in Europe and the North Sea world. The steps and transformations of this urban network are unraveled in an analysis bridging contextual archaeology and scientific analysis.

05 ARTEFACT GEOGRAPHIES OF THE VIKING AGE: COMBS, ZOOMS, AND EARLY-MEDIEVAL COMMUNICATION

Author: Muñoz-Rodríguez, Mariana - University of York; Stockholm University (Presenting author)
Keywords: Vikings, ZooMS, biogeography
Presentation Preference: Oral

This paper discusses the aims, methods, and preliminary results of of a new project, undertaken under the EU-funded ArchSci2020 programme. The research builds upon previous work focusing on Viking-Age and medieval hair combs. This study applies Zooarchaeology by Mass Spectrometry (ZooMS), a low-cost and minimally destructive proteomic technique for the identification of raw materials, in order to trace the production, distribution, deposition of hair combs across the Viking world. Because of their portability and wide geographic presence across northern Europe, antler hair combs hold significant potential as proxies for trade, migration, and the movement of raw material. However, few multi-site syntheses have been undertaken. ZooMS can distinguish between the antler of biogeographically discreet deer species (e.g. red deer, reindeer, and elk) from which comb crafting components are sourced. By applying ZooMS to the study of antler hair combs recovered from a variety of Viking sites across northern Europe, we can further characterise the technological innovations and population dynamics of this period. This study not only aims to address previously unanswerable questions about the Viking Age, but also considers transdisciplinary methodological approaches which may contribute to future biomolecular studies on raw material from the Early Medieval period.

06 AROUND THE BARBARIAN SEA: THE END OF THE EARLY MEDIEVAL SETTLEMENTS OF THE BALTIC.

Author: Thoeming, Alix - The University of Sydney (Presenting author)
Keywords: urbanism, theoretical, viking
Presentation Preference: Oral

The development of urbanism in the Viking Age is undoubtedly one of the best-studied fields in the archaeology of the period. The Viking towns of Birka, Kaupang, Hedeby and Ribe have captured the imagination of archaeologists and the public alike, presenting the lives of their enigmatic inhabitants. Occasionally mentioned in the literature but rarely discussed comparatively are a significant number of other settlements located across the Baltic coast, from northern Germany to the tributary rivers of north-western Russia, which appear at a very similar time, in very similar forms, in response to ostensibly similar circumstances. Some of these settlements have remained through to today, with the others meeting very different ends, but all transformed in some way into the later, more easily recognisable high medieval town. A theoretical model investigating the variation in these outcomes to explain the reasons for their occurrence has been employed, and this paper will present the results of a PhD on just this topic. First discussing the reasons and justification for considering the Baltic as a meaningful network, this paper will then explore this methodology, before presenting the results and their implications.

07 ASSESSING THE LATE MEDIEVAL URBAN FOOTPRINT

Author: Dr Oosten, Roos - Leiden University (Presenting author)
Keywords: Urban Footprint
Presentation Preference: Oral

Ayers, in his much applauded book The German Ocean: Medieval Europe around the North Sea (2015), argues that the rapidly increasing consumption of marine fish at the turn of the second millennium indicates a 'systematic change as a result of urban development'. In my presentation, I will address the 'big question' of the late mediaeval urban footprint—the impact of towns on the environment. The Low Countries (together with Italy) were, during the Late Middle Ages, the most urbanised parts of Europe, yet similar 'systematic (archaeo-enviromental) change indicators' seem to be rare, at least on first sight. However, looking beyond the traditional 'site and artefact' approach reveals interesting, albeit piecemeal, evidence to substantiate the claim that an urban footprint left its vestige in the archaeological record. I will suggest how, in addition to question-driven research, 'the third revolution in archaeological science' can help tackle this issue.

08 HIGH RESOLUTION STUDIES OF THE URBAN STRATIGRAPHY IN BRUSSELS (BELGIUM)

Author: Mr Devos, Yannick - Université Libre de Bruxelles
Co-Author: Dr Nicosia, Cristiano - Université Libre de Bruxelles, Centre de Recherches en Archéologie et Patrimoine; Dr Vrydaghs, Luc - Université Libre de Bruxelles, Centre de Recherches en Archéologie et Patrimoine; Ms Modrie, Sylvianne - Department of Archaeology, Brussels Regional Public Service; Dr Degraeve, Ann - Department of Archaeology, Brussels Regional Public Service (Presenting author)
Keywords: urban archaeology, geoarchaeology
Presentation Preference: Oral

As a result of many superimposed phases of human occupation, urban stratigraphy is often thick and complex. This is also the case in Brussels, where over the last decades a specific research protocol has been developed to overcome this complexity issue. A particular focus has been on microstratified layers and urban Dark Earth. The latter are thick, dark coloured, humic, homogeneous units covering large areas (Nicosia & Devos, 2014).
Through a series of chosen examples, we will discuss the potential of such studies regarding the urban development. We will hereby focus on the origins of Brussels, its spatial organisation and waste management.

Bibliography
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09 ON THE BORDER OF THE TOWN AND THE RIVER, PRAGUE WASTE DUMPS 14TH - 19TH CENTURY

Author: Mgr. Kuchařík, Milan - Labrys o.p.s. (Presenting author)
Keywords: town, river, waste
Presentation Preference: Poster

During archaeological excavations (2014 - 2016) on the outskirts of the medieval Prague, on the banks of the Vltava river we found rare and well-preserved marginal archaeological situation of the city. In the river valley before and after town wall arose gradually municipal waste landfills that capture the material culture of medieval Prague 14th to 19th century. The layers have a thickness of up to 11 m. They were here also located various services f.e. knackery, hangmanhouse warehouses, timber depots etc.

10 THE LISBON CONNECTION - TRACES OF WORLD TRADE ROUTES IN 17TH CENTURY GOTHENBURG

Author: Mr Wennberg, Tom - Museum of Gothenburg (Presenting author)
Keywords: tinglazed earthenwares, Gothenburg
Presentation Preference: Oral

The period from the 15th century to the 18th century is sometimes called the Age of Discovery and within this time frame the world became connected on a global scale. The Portuguese and Spanish empires where the leading parties in this process during the 15th and 16th century. During the 17th century the British and the Dutch empires also became contenders for the world dominance. The world trade routes became more established and we are now talking about proto-globalization. The term describes the phase of increasing trade links and cultural exchange on a global scale.

The city of Gothenburg where founded 1621 by king Gustavus Adolphus of Sweden with the specific purpose to be a part of this global trade. Gothenburg played a peripheral role in this system of trade routes during the 17th century. There are, however, both written and archaeological evidence of the world trade strongly influencing the inhabitants of

Gothenburg. Tobacco, exotic spices and ceramics are typical finds that give evidence for this long distance trade. One of the centers of trade with connection to Gothenburg was Lisbon. The importance of this specific connection has recently become apparent in the archaeological source material.

This presentation will give a brief overview of 17th century Portuguese tin-glazed earthenwares (Portuguese faience) found in Gothenburg, as known of today. Tinglazed earthenwares are fairly common in archaeological 17th century contexts of Gothenburg. The majority of these materials origins from the Lower Countries, but the overall picture are more complex. Recent studies have shown that Portuguese tin-glazed wares have reached Gothenburg in a larger extent than known before. Several excavations shows as much as 25 % of faience with Portuguese origin. This presentation will give some examples of these wares and explain why we find them in a Gothenburg 17th century context.

11 A GEOARCHAEOLOGICAL TALE OF TWO INSULAE: URBAN LIFE IN A ROMAN FRONTIER ZONE

Author: Banerjea, Rowena - University of Reading (Presenting author)
Co-Author: Fulford, Mike - University of Reading; Barnett, Catherine - University of Reading
Keywords: Geoarchaeology, Roman urbanism
Presentation Preference: Oral

Silchester (Hampshire, UK) is 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. Unlike the majority of Roman towns in Britain, which saw subsequent development from the medieval period up to the present, Silchester was abandoned and has remained a 'greenfield' site. It became the focus of antiquarian interest in the later nineteenth century when a sustained project (1890–1909) was initiated to recover the compete plan of a Roman town. Fortunately, these excavations were relatively superficial, allowing the possibility for modern archaeology with stratigraphic and geoarchaeological methodologies to explore the development and changing character of the town from Iron Age origins to post-Roman abandonment in much greater depth. With such objectives, the Silchester Town Life Project was initiated in 1997, focusing on a large area (3000m2) of Insula IX. The fieldwork was completed in 2014. Current excavations are focussing on Insula III.
Micromorphology and geochemistry have been instrumental in revealing the intensity of the pre-conquest Iron Age occupation, an in illuminating the daily lives of the inhabitants of Roman timber-framed and earthen-walled structures that are frequently modified through time.
The site itself lies on a gravel terrace, which results in largely acidic preservation conditions. However, the open area nature of the excavation has enabled preservation to be examined across both insulae with some unexpected results, particularly with the preservation of ash and dung layers in dark earths, and differences in ash preservation between Insula III and IX.

12 ASSESSING CROP CULTIVATION AND PROVISION THROUGH STABLE ISOTOPE ANALYSIS ON BOTANICAL REMAINS FROM MEDIEVAL ODENSE

Author: Ms Hammers, Neeke - Aarhus University; Centre for Urban Network Evolutions (Presenting author)
Keywords: stable isotopes, archaeobotany
Presentation Preference: Oral

This paper will discuss the use of stable carbon and nitrogen isotope analysis on charred cereal remains from medieval sites in Odense, Denmark, to assess crop cultivation practices. The sites used in this study are located within a short distance of each other and are dated to 1200-1500 CE. The differences in settlement size and site use make that these localities are an interesting case study for assessing local differences in crop cultivation practices and crop provision.
Where analysis of plant macrofossil remains can provide information on which species were present and how these have been processed at the sites, isotope analyses can add to this knowledge by providing insights in spatial and temporal differences in crop acquisition and cultivation. Differences between cereal crops as a result of growth conditions and agricultural practices that may be impossible to detect morphologically can be reflected in the carbon and nitrogen isotope data. In addition to assessing inter-site differences, this method allows analysing intra-site differences on materials recovered from different contexts.
Analyses of the stable isotope values in barley, rye, and oats from the sites in Odense reveal differences in agricultural practices and the acquisition of plant material between the crop species and the sites, which could provide information on the sites´ subsistence systems and potential local and regional trade connections.

13 STORIES FROM THE CITY, STORIES FROM THE SEA: BUILDING NARRATIVES USING HIGH-RESOLUTION CHRONOLOGICAL SYNTHESIS OF URBAN ECOFACTUAL DATA

Author: Dr. Orton, David - University of York (Presenting author)
Co-Author: Dr. Morris, James - University of Central Lancashire
Keywords: zooarchaeology, uncertainty, meta-analysis
Presentation Preference: Oral

As the cumulative volume of ecofactual data from archaeological sites mounts, the analytical tools required for its synthesis have not always kept pace. Nowhere is this more acute than for urban settlements, where complex, well-dated stratigraphy; rich organic remains; and multiple small-scale excavations often lead to an abundance of small datasets with cross-cutting phasing and varied chronological resolution. Individually these may be of limited value; together they represent the environmental and socioeconomic history of a city. The challenge lies in developing tools for effective synthesis.

This paper presents a new approach to synthesis of urban ecofactual data, employing simple Monte Carlo simulation to combine sites, contexts, and specimens at the maximum available dating resolution, while visualising the inevitable uncertainty inherent in the resulting chronological distributions. Where available, data on the distribution of research effort (e.g. sampled volumes) can be incorporated in order to make inferences regarding absolute changes in deposition rates. This is illustrated with two brief examples from medieval London, respectively addressing the rise of marine fish consumption and the subsequent onset of long distance trade in cod - both phenomena linked in part to the provisioning needs of a growing urban population.

Finally, the paper considers how effectively this approach can be extended beyond frequencies of major food taxa to (a) presence of small mammals and other urban fauna; (b) non-frequency data such as metrics or stable isotopes, and (c) spatial comparisons between or within towns.

14 SCAVENGERS. AN ECOLOGICAL PERSPECTIVE ON THE URBAN WILDLIFE OF A 6TH CENTURY CITY

Author: Dr Baron, Henriette - Römisch-Germanisches Zentralmuseum (Presenting author)
Keywords: zooarchaeology rats ecology
Presentation Preference: Oral

Little is known about the animal inhabitants of past cities, like wild birds, bats, or rats. In the course of history especially the commensals became our closest cohabitants. Nevertheless their role in urban ecosystems, be it as storage pests or as carriers of disease, is often mentioned but rarely scrutinized – mainly because finds are rare. Drawing on results from various co-working disciplines, this paper aims to contextualize the urban commensal fauna of the Early Byzantine city Caričin Grad (Serbia) in its ecological frame. This analysis is part of an interdisciplinary research project of the Römisch-Germanisches Zentralmuseum and Mainz University which aims to understand the economy and the urban ecology of this city and its environs. It is assumed that the site represents Iustiniana prima, the city Justinian I. (527-565 AD) erected close to his birthplace, but which was occupied only 80 years. With its short existence and compact layout, it is a perfect example for the new type of city emerging in this century, which mixes classical features like an acropolis with numerous churches and, above all, a decidedly rural element.
Apart from history, archaeology, and zooarchaeology, the project involves architectural 3D-modelling, archaeobotany, soil analysis, geology, and isotope studies. Furthermore, a cooperation with Ben Krause-Kyora from Kiel university allowed for DNA analyses of the rat bone finds – in search of the plague which had ravaged the Empire in these decades. Within the frame of the urban ecology approach, the close interdisciplinary collaboration allows to contextualize the urban wildlife in the city and its surroundings. Links between human action and urban food chains as well as limiting and favorable factors for the commensal species can be identified, and new insights into human-animal-interactions gained – with a special focus on the role of urban rats as carriers of disease.

15 PHYTOLITH BASED IDENTIFICATION OF CROP PLANTS WITHIN URBAN CONTEXTS. A MICROMORPHOLOGICAL APPROACH

Author: Dr Vrydaghs, Luc - Université Libre de Bruxelles
Co-Author: Prof. B Ball, Terry - Brigham Young University; Prof. Fuller, Dorian - University College London; Mr Devos, Yannick - Université Libre de Bruxelles (Presenting author)
Keywords: phytoliths, urban archaeology
Presentation Preference: Poster

The preservation of organic botanical remains, such as pollen and plant macroremains in urban contexts is often rather poor, especially in aerated conditions. Phytoliths, however can survive in these contexts. As such, they become an important source of information on ancient vegetation, assuming that botanical identification of these microfossils can be accomplished.
In contrast to pollen, phytoliths are formed within different plant organs and tissue. Furthermore, different phytolith shapes can be produced within a single taxon (multiplicity) and some phytolith shapes can occur within different plant species (redundancy). Therefore, botanical identification of a phytolith assemblage requires researchers to have the confidence that the phytoliths in the assemblage have the same depositional history and origin. In archaeological contexts, and especially in urban deposits such as Dark Earth, not all phytoliths share necessarily a common history thus hampering their botanical identification (Vrydaghs et al. 2016).
To overcome these issues, we analyze phytolith in soil thin sections, which allows us to observe the position of each component and to better understand its origin and depositional history. This helps to identify phytoliths sharing a common botanical origin, and facilitates their identification, especially by using morphometry: the measurements of size and shape of the phytoliths.
Parallel to this approach, an adapted reference collection is currently being developed to improve morphometrical based botanical identification of the phytoliths (Ball et al. 2017).

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Vrydaghs, L., Ball, T.B. and Devos, Y. 2016. Beyond redundancy and multiplicity. Integrating phytolith analysis and micromorphology to the study of Brussels Dark Earth. Journal of Archaeological Sciences 68: 79-88.

314 THE VALUE OF ALL THINGS: VALUE EXPRESSION AND VALUE ASSESSMENT IN THE ANCIENT WORLD (EUROPE, NEAR EAST AND THE MEDITERRANEAN)

Theme: 6. Interpreting the archaeological record
Author: Gorgues, Alexis (France) - Bordeaux Montaigne University
Co-Author(s): Melheim, Lene (Norway) - Museum of Cultural History, OsloPoigt, Thibaud (France) - Casa de Velazquez; Toulouse-Jean Jaurès and Bordeaux Montaigne universities
Keywords: Late Prehistory, value, trade, exchange
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The idea that things have a value is probably almost universal. In contrast, as a social construction, value assessment may be very different from one place to another. Roughly, we can consider that the social "construction" of value can follow three different paths.
Firstly, value can be measured and expressed according to one or more standard units. Such behaviors are nowadays intensely investigated, mainly through the study of the various forms of currency of through the materiality of measurement
Secondly, value may be related with the symbolic relevance of things: prestige transmitted through successive owners, provenience, uses... This dimension of value is mainly explored through the study of objects biography.
Thirdly, value may be linked with the labor related to the making of the object, with its quality. This labor value is indeed poorly investigated, but can be approached through technique studies, still fashionable nowadays.
Value is often assessed by taking more than one of these criteria into consideration, and actual scenarios are indeed numerous and complex. Furthermore, a transformation of this value can occur, especially in the case of interaction between cultures with different currencies or different value systems. We invite, in this session, contributions interested in dealing with the many faces of value, with value assessment practices and with cross-culture value assessment in a long-term perspective, in Europe, Near East and the Mediterranean, from the Bronze to the Iron Age. Contributors may present papers or posters discussing one of the aspects mentioned before, or cross-analysis considering different factors.

01 INTRODUCTION

Author: Mr Poigt, Thibaud - Casa de Velazquez; Université Bordeaux Montaigne; Université Toulouse 2 Jean-Jaurès (Presenting author)
Keywords: Archaeology, theory, value
Presentation Preference: Oral

The concept of value is probably universal. However, archaeologists deal with it indirectly, mainly through the study of social, economic, and production practices, more directly observable and interpretable from an archaeological point of view. Nevertheless, value, as a characteristic often attached to an artefact, is a very relevant topic for archaeologists, for it participates fully to the construction of materiality.

The aim of this session is to deal with the many faces of value and with value assessment practices from the Bronze Age to the Roman Period. It will be divided into three blocks of papers, each one focus on one aspect of value. The first point will concern the materialisation of social values into the society: from the structuration of political authority and economy to the integration and perception of exoticism. In a second time, we will examine how the biography of an artefact could participate to the progressive construction of a subjective value, which cannot be objectively measured but could be acknowledged in a specific social context: technical complexity, origin, intrinsic value of material, visual aspect, precedent owners... Finally, we will conclude this session by addressing the topic of the formalisation and the institutionalisation of value, and therefore of its assessment within trade relationship. This last theme is at the very origin of the session organisation. The increased investigations on pre-monetary forms, measurement tools, standardisation of artefacts have emphasized the necessity to define more precisely the notions of "value" and "value range".

02 DIFFERENT CULTURE – DIFFERENT VALUE

Author: PhD Gralak, Tomasz - Uniwersytet Wrocławski (Presenting author)
Keywords: European Barbaricum, economy
Presentation Preference: Oral

Cultural boundaries might have resulted from differences in the structure of power and relation to the capital. An example of this phenomenon is the relationship between the populations of Wielbark and Przeworsk cultures which had existed durring Roman influences period in European Barbaricum. The comparison was carried out using a simplified method of structural description after C. Levi-Strauss. The binary opposites that occurred in the burial rites of both cultures have been noted. These were identified by the principle of the zero-one system (0:1) as following:
1. Small number of mound features - common presence of mound features
2. Occasional stone structures in cemeteries - common stone structures in cemeteries
3. Weapons in graves - lack of weapons in graves
4. Iron in graves - non-ferrous and precious metals in graves
5. Simple iron jewellery - opulent jewellery of non-ferrous and precious metals
6. Large diversity in male and female grave goods - little diversity in male and female grave goods
7. Destruction of grave goods - lack of destruction of grave goods
Interpretation of this opposites shows basic differences in social structure in this two cultures. It concerns questions like rank, legacy, capital, gender. In both cases grave goods can be seen as a potlatch also. This phenomenon seems to be crucial to understand circulation of capital in pre capitalist economy.

03 MINOAN VALUE? MEANING OF THE ARTIFACTS FROM CRETE IN MYCENAEAN GRAVE CIRCLES

Author: MA Dudlik, Katarzyna - Adam Mickiewicz University (Presenting author)
Keywords: Mycenae, Minoan, prestige
Presentation Preference: Oral

Contacts between the communities of the Aegean are part of the complicated system, integrating regions of Greece, Crete, Levant, Cilicia and Cyprus. Each of them produced some luxurious objects, which further were the product of exchange between cultures. It is clear that the intensification of contacts between the centers of the eastern Mediterranean, especially on the line between Greece and Crete, was one of the most important in the process of complication of Mycenaean social structures.

The idea of the paper is to present issues of intercultural contacts between Greece and Crete in the early Mycenaean period (Middle Helladic IIIA – Late Helladic IIB, about 1775-1420 BC). Firstly, the nature of relationships between Crete and Mycenae should be characterized. The posed questions will concern on motivation for contacts, their frequency and distinguished elements – which is highly connected with the circulation of people, artifacts and ideas in Aegean world.

Secondly, the main subject of the paper will be raised – the role, which Minoan society had on creation of early Mycenaean culture. It should be pointed, that not only the upper classes from Crete played that role, but mostly the people engaged in the exchange of goods and crafts. Among the offerings from Mycenaean Grave Circles, many of them were made by Minoan craftsmen, who combined the different traditions of manufacturing. Based on the popularity of the Minoan artifacts, the term of Minoan value could be proposed. The Cretan objects were made in highest quality – in various and complicated techniques and with elaborated and sophisticated decorations. Undoubtedly, in Mycenaean society they were treated as prestigious objects of the highest value and they played a significant role in a process of creation of the social status.

04 DO BEADS HAVE VALUE BEYOND THE AESTHETIC?

Author: Dr Miller, Holly - University of Nottingham (Presenting author)
Co-Author: Dr Bysal, Emma - Trakya University
Keywords: Beads, Ornamentation, EBA
Presentation Preference: Oral

Beads and other items of personal ornamentation are a category of artefact that remains largely under-studied and under-theorised. Where studies of other material cultures have moved beyond 'form' and 'function', analysis of these sorts seem to be inextricably linked with artefacts that are valued, at least in the present, purely for their aesthetic properties.

Do these items have value beyond 'ornamentation'; their outward-looking, visually driven social presence of decorative purpose? In this paper we will address the idea of 'personal ornamentation' with reference to Early Bronze Age Anatolia, in particular the case-study site of Basur Hoyuk. We will theorise how and where personal values may be seen in the archaeological record, and how this may change the value of items judged, in the archaeological record, to be purely aesthetic.

05 LABOUR AND VALUE IN THE WESTERN MEDITERRANEAN IRON AGE

Author: Dr Gorgues, Alexis - Université Bordeaux Montaigne; UMR 5607 Ausonius (Presenting author)
Keywords: Elites, Iron Age
Presentation Preference: Oral

Since B. Malinowski's work on the western Pacific, the idea that the adscription of a value to an object could largely derive from its own history, and among other factors from the prestige of its successive owners, has become commonplace. Recent approaches, like objects biographies, enhanced by the development of new means of observation (3D imagery for instance) have allowed for assessing the complexity of the trajectory of some artefacts. However, linking the many lives of an object with its value remains a complex process. As a matter of fact, inferences on the value of artefacts are mainly based on the material(s) used to make it, and on the skills that had to be mobilized. Labour is considered as constitutive of the value, more or less in a market perspective: "abundant" skills are related with "low value" objects, "rare" skills with high-value ones.
This paper will argue that although this point of view appears as largely justified, it is incomplete. An object could possess an initial prestige value not only linked with the skills mobilized to make it, but with the personal status of the maker. Through a context-driven analysis, this paper will show that, in the Western Mediterranean Iron Age (southern Gaul, Eastern Spain), elites could be directly involved in the production processes, in order to produce objects which would not only carry their skills, but also their prestige: elite-made artefacts, prestigious because they were made by elite members. In other words, the value of labour was not only linked with the nature of the skills involved in the technical process, but also with the status and prestige of the person who implemented it. Comparisons with other chronological and geographical areas will show that such a situation finds parallels elsewhere.

06 WEIGHTS OF EARLY BRONZE AGE AXES IN THE ATLANTIC AREA: A COMPUTATIONAL APPROACH

Author: Dr. Rubio-Campillo, Xavier - Lecturer in Archeology. Computational Archaeology. University of Edinburgh
Co-Author: Dr Rodríguez del Cueto, Fernando - Assistant Lecturer in Prehistory. Department of History. Area of Prehistory. University of Oviedo (Presenting author)
Keywords: Weights, Prehistory, Computational
Presentation Preference: Oral

The last decades have seen the emergence of an intense debate on the existence of standardized weight systems in prehistoric contexts. The presence of these systems could be part of the prehistoric trade and weighted metal would be, according to this view, part of the exchanges as a means of payment. Bronze Age studies have an important role on this discussion; specially in the last part of the period, in which it is additionally possible to link the archaeological materials with written sources.
The present study aims to enrich this debate by exploring the presence of weight systems on Bronze Age materials found in two regions of the Atlantic area. The largest group comes from the Scottish Early Bronze Age. This evidence was complemented by the analysis of the collections of the Archaeological Museum of Asturias. This group was smaller in size, but we must consider the relevance of the Asturian case: first, for their relation to an area with several prehistoric copper mines. Second, because we can study materials that represent different parts of the metallurgy process.
We applied an innovative quantitative approach to identify the existence of standardized weights. Three competing hypotheses were evaluated and transformed into statistical models: a) no standard weights, b) a single standard weight and c) multiple standard weights. A model selection approach was used to evaluate which model was better suited to generate the existing evidence for multiple case studies. The method allowed us to identify the best-fitted hypothesis to each scenario while also integrating under what extent axehead fragmentation could bias these results.
This work will present the preliminary results of this analysis. While additional works will be needed, we believe that the initial comparative assessment of the case studies will promote further discussion on the important topic of prehistoric trade.

07 TOOLS AND TOKENS OF VALUE: MASSIVE SHAFTHOLE AXES AS VALUE DENOMINATORS IN BRONZE AGE SCANDINAVIA

Author: PhD Melheim, Lene - Museum of Cultural History University of Oslo (Presenting author)
Keywords: axes, weight, value
Presentation Preference: Oral

Throughout Scandinavian prehistory, value assessment seems to have centered around certain object categories, most notably axes of stone or metal. Weight units is another factor of value, and during the Bronze Age a system of standardized weight units was used in Scandinavia, which linked up with weight systems widely used in the Mediterranean area. This system was first identified through analysis of, among other things, the so-called Fårdrup axes, massive and heavy shafthole axes of bronze, dated to c. 1600-1500 BC. Chemical analyses of axes from the eponymous Fårdrup hoard in Denmark have shown that the metal is homogenous chemically speaking and with very tight tin ranges; in all likelihood coming from one lot of metal. In Sweden and Norway a different pattern is seen, with different alloys and perhaps other suppliers of metal. The Fårdrup axes are often beautifully decorated, sometimes with emblems of other high-status metalwork. The decoration, or lack of such, seems to some degree to correlate with metal type. Is there any clear connection between the metal's provenance and other axe qualities? Drawing on provenance analysis, weight units and ornamentation, this paper will address how value was created and curated through the making of such axes, and manipulated through their circulation and deposition. I argue that the Fårdrup axes had at least triple functions: as functional tools – ingots – and value denominators.

08 THE EARLIEST BALANCE WEIGHTS IN THE WEST: EXPLORING LONG-DISTANCE CONNECTIONS IN VALUE-SYSTEMS ACROSS BRONZE AGE EUROPE

Author: Dr Ialongo, Nicola - Georg-August-Universität Göttingen (Presenting author)
Keywords: Bronze-Age, balance-weights, value-systems
Presentation Preference: Oral

This paper will present and discuss unpublished evidence related to sets of balance weights, recently identified in several Bronze Age sites in the Aeolian Islands (Sicily). The materials date from different periods of the BA, but show a clear clustering in contexts of the first half of the 2nd Millennium BC: this makes the Aeolian weights the earliest known, so far, in Europe (outside the Aegean).

After briefly addressing the problem of the identification of balance weights in prehistoric contexts, the discussion will focus on the reconstruction of the weight system underlying the Aeolian weights, and on its correlation with other European systems, theorized by earlier studies.

The question of balance weights is addressed within the broader problem of commodity-exchange. For Bronze Age Europe, provenance studies of raw materials, in particular metals, are recently raising the question of a continent-wide network of commodity-exchange. A striking contrast existed between the distribution of sources and products: the former were rare, concentrated and unevenly distributed, the latter nearly ubiquitous. The disequilibrium in the relative cost of producing and importing different commodities, at a continental-scale, was probably accompanied by the emergence of regionally differentiated, socially acknowledged, yet fluctuating perceptions of costs and gains: i.e., different value-systems had to be converted, in order to make cross-regional exchange possible. In this perspective, weight systems may have worked as neutral devices, providing a shared framework to quantify individual expectations.

The analyses show that the weight system in use in the Aeolian Islands in the early 2nd Millennium BC is basically equivalent to that expressed by Late Bronze Age weights, in Central Europe, several centuries later. Both systems, furthermore, are compatible with different known standard units, contemporarily in use in the Aegean and in the eastern Mediterranean.

316 GUNFLINTS: PRODUCTION, DISTRIBUTION AND USE

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Budziszewski, Janusz (Poland) - Cardinal Stefan Wyszynski University in Warsaw
Co-Author(s): Trnka, Gerhard (Austria) - Institute of Prehistoric and Historical Archaeology, University of ViennaHauzeur, Anne (Belgium) - SARL Paleotime and cooperation partner of the Royal Belgian Institute of Natural SciencesBrandl, Michael (Austria) - Austrian Academy of Sciences, OREA-Institute, Dept. for European Archaeology
Keywords: Gunflint, mining, processing techniques,
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Relatively hardly known gunflint industry is one of the most interesting subjects in military and economic history of Europe between the late 16th and mid 19th century. Studies of this issue need cooperation of petrologists, archaeologists and historians. Till now only history of gunflint industry from British and French empires was studied more extensively. In many other regions this subject was negligent. Only lately it started to be more often undertaken by researchers.
This session calls for contributions that focus on the following research issues:
- Identification of raw material sources
- The role of physical properties in raw material choice
- Raw material mining strategies
- Gunflints production and processing techniques
- Regional gunflint typologies
- Distribution systems
- Use-wear analysis of gunflints
- Gunflints in research on battlefields

01 GUNFLINT WORKSHOPS WITHIN THE HISTORICAL BORDERS OF KINGDOM OF POLAND

Author: MA Niebylski, Jakub - Jagiellonian University, Cracow (Presenting author)
Keywords: Gunflints, Workshops, Mines
Presentation Preference: Oral

Due to its geographical position, the Polish state has a turbulant history. In 1795 Poland disappeared from the maps of Europe and was reconstructed as an independent country only in 1918. On the Polish territories that belonged to Austrian and Russian Empires, from the 2nd part of the 18th till the 19th centuries, numerous gunflint workshops were operating. One of the workshop centres were situated in Cracow region (southern Poland). Further workshops were to befound also in Ivano-Frankivsk (Ukraine, former Habsburgian monarchy) and Kremenets (Ukraine, former Russian monarchy) regions.

The number of workshops, the quantity of products and its export justifies its significance on the European scale. In order to get a better understanding of the workshops it is necessary to compare the dating, localization, descriptions from various sources and the quantity of production. The data processed in such way would be further used for studying of the gunflint production and would help us understand its role in that area.

The nature of the archaeolgical sites is diverse. There are reports even about exporting of the raw material for longer distances (e.g. from Cracow region to Ruzomberok in Slovakia) where it was processed into the ready product. We are able to pinpoint the places where the raw materials was extracted, where were the workshop sites with waste products deposited, as well as the buildings in which the stage of flint forming used to be accomplished. Occasionally we can point only the name of area where gunflint were produced without giving a specific archaeological site. Although a lot of important sites has not been found yet, the area itself is being currently meticulously processed with the help of surveying methods. The previous findings and success of the former excavations augurs new discoveries in the nearest future.

02 TRACES OF MODERN FLINT MINING IN CRACOW CENTER OF GUNFLINT PRODUCTION

Author: MA Jakubczak, Michał - Institute of Archaeology and Ethnology Polish Academy of Sciences, Warsaw; Institute of Archaeology, Cardinal Wyszyński University in Warsaw (Presenting author)
Co-Author: MA Szubski, Michał - Institute of Archaeology, Cardinal Wyszyński University in Warsaw; MA Niebylski, Jakub - Institute of Archaeology, Jagiellonian University, Cracow; Dr Budziszewski, Janusz - Institute of Archaeology, Cardinal Wyszyński University in Warsaw
Keywords: Gunflint, mining, ALS
Presentation Preference: Oral

Due to airborne laser scanning (ALS, LiDAR), the study of flint mines with anthropogenic mining relief has become easier. In recent years, the Institute of Archaeology at Cardinal Stefan Wyszynski University in Warsaw has been investigating different flint mines in Poland using LiDAR. Along with Project ISOK, which provided free ALS data for Poland, we have been checking all presumed areas, searching for flint mines. In between them was the largest area of gunflints manufacturing known from Poland territory. It is located near Cracow in southern Poland and based on Jurassic flint.

We identified three modern flint mines in this region - Zelków, Karniowce and Mników. They have got preserved anthropogenic relief and well-preserved flint workshops on the surface. Anthropogenic relief of modern flint mines differ strongly from prehistoric ones. Modern exploitation pits were markedly larger. What is extremely interesting, between the gunflint mines are clearly visible differences in extraction methods. Probably they result from chronological dissimilarities.

03 FLINT KNAPPING TECHNOLOGY AT GUNFLINT WORKSHOPS NEAR CRACOW (SOUTH POLAND). FIRST APPROACH

Author: MA Szubski, Michal - Institute of Archaeology, University of Cardinal Stefan Wyszynski in Warsaw (Presenting author)
Co-Author: Dr Gruźdź, Witold - State Archaeological Museum in Warsaw; Dr Budziszewski, Janusz - Institute of Archaeology, University of Cardinal Stefan Wyszynski in Warsaw
Keywords: gunflint, technology, Poland
Presentation Preference: Oral

The study of gunflints is usually limited to the identification of the finished pieces - which are often the mass material at sites. More and more commonly discussed the issue of gunflints production increasingly becoming the subject of flint studies. But often lacking, for obvious reasons, technological analysis. There remain only written sources for that research.
In southern Poland, near the village of Zelków and Karniowice, as well as in Mników there are, witnessed in written sources, mines of Jurassic flint connected with gunflint production. They have got preserved anthropogenic relief and well-preserved flint workshops on the surface. Assemblages from field survey allows us to reconstruct almost the whole chaine operatiore used by gunflint manufactures in this region. What is extremely interesting, between the mines are clearly visible differences in extraction methods, which are also reflected in the diversity of flint technology.
Detailed analyze were surface flint materials from sites in Zelków, Karniowice and Mników. This studies included a set of cores and technological blanks. We also analyzed the old collections of ready-made gunflints of Jurassic flint. Our efforts lead us to first attempt to recreate chaine operatoire for Polish gunflint workshops as well to determinate difference between particular sites.

04 HONEY BROWN GUNFLINTS FROM BELARUS AND GUNFLINT WORKSHOP IN ZELKÓW (SOUTH POLAND) – THE STATE OF KNOWLEDGE

Author: Dr Werra, Dagmara H. - The Institute of Archaeology and Ethnology Polish Academy of Sciences (Presenting author)
Co-Author: Vashanau, Aliaksandr - Institute of History, National Academy of Sciences of Belarus; Dr Brandl, Michael - Oriental and European Archaeology (OREA), Austrian Academy of Sciences, Vienna; Asheichyk, Vitali - Institute of History, National Academy of Sciences of Belarus; Dr Wozny, Marzena - Archaeological Muzeum of Kraków
Keywords: LA-ICP-MS, Belarus, Poland
Presentation Preference: Oral

At the end of the Bronze Age and at the beginning of the Iron Age, people stopped using flint as a basic material for producing tools and weapon. Iron has taken flint's place for further centuries. Despite the fact that flint lost its role, it was still used, however in smaller extent. It was used locally and it served domestic purposes (as knife, to make fire, as tribulum). Ethnographic studies has shown that flint was used in the first decades of 20th century.
The mass using of flint in modern times (16th—19th century) is very interesting issue. It was related to using flint for military purposes, as an element of firearm – it was used to the mid-nineteenth century. Flint was used for longer time (up to the beginning of 20th century) for the production of hunting weapons.
Several Jurassic-Cracow flint manufactories were located in the neighbourhoods of Cracow where flint was abundant. One of the largest and best preserved was a manufactory in Zelkow, a town which in the 19th century lied just on the border of Russia and Austro-Hungary.
Gunflints which are registered in the area of today's Belarus were made of not only local raw materials (Volhynian and Erratic flint), but also nonlocal flints, which arrived there in a ready form. For the present study we analyzes collection of gunflints from Institute of History National Academy of Sciences of Belarus. For seven samples, from different places, we applied Laser Ablation Inductively Coupled Plasma Mass Spectrometry in order to characterize the materials and to assess the potential of a source differentiation.
This paper discusses some issues of the mass production of gunflints in the modern era based on a case study of the flint manufactory in Belarus and Poland, and the distribution of gunflints in this area.

05 IN THE FOOTSTEPS OF BALTHASAR HACQUET. THE REDISCOVERY OF LICHOSTIWNE HILL, WESTERN UKRAINE.

Author: Dr. Brandl, Michael - Austrian Academy of Sciences, Institute for Oriental and European Archaeology (OREA)
Co-Author: Dr. Trnka, Gerhard - University of Vienna, Institute of Prehistoric and Historical Archaeology (Presenting author)
Keywords: Gunflints, Galicia, Lichostiwne
Presentation Preference: Oral

Balthasar Hacquet de la Motte (1739/40–1815) was of French descent and a true polymath working in the fields of medicine, chemistry, geology, mineralogy, botany and ethnography. It was mainly due to his endeavors that a gunflint industry was established in the former Galician territories of the Austrian empire.
The difficult political situation at the end of the 18th century induced the Austrian emperors to gain independence from foreign gunflint suppliers, most importantly France. Various attempts to install a gunflint industry within the Austrian Monarchy failed, partly due to the lack of the technical know-how, but more importantly due to the lack of suitable raw materials for gunflint production. This situation changed when Balthasar Hacquet was appointed professor for Natural History in Lemberg (Lviv) in 1787. Hacquet explored the

remote areas of eastern Galicia with a focus on economic aspects for the Monarchy. He discovered rich deposits of high quality flint, especially in Podolia and Pokuttia, and the first factory was established in Nizniow (contemporary Nyzhniv, Ivano-Frankivsk Oblast) as early as 1787/88. The flint was initially quarried in the hinterland of Nizniow, and after depletion of the sources brought in from further away. One important quarrying site was Lichostiwne Hill, described by Hacquet as follows:
"This rolling hill, which does not rise to more than 80 fathoms, is covered with gorgeous meadows, bushes and trees, and slightly slopes from west to south. Its interior consists of a chalk-like white limestone. The flint occurs there at an elevation of 30 to 40 fathoms from the road level in the valley in five distinct layers or banks...".
During a 2013 field trip the authors were able to locate Lichostiwne Hill with the help of a local collector. Here we present our findings and future prospects on gunflint research in former Austrian Galicia.

06 GUN FLINTS FROM THE ORDON'S REDOUBT (WARSAW) – AN EXPERIMENTAL AND MICROWEAR APPROACH

Author: MA Paczkowski, Michał - State Archaeological Museum in Warsaw (Presenting author)
Co-Author: PhD Pyzewicz, Katarzyna - Adam Mickiewicz University in Poznań; MA Migal, Witold - State Archaeological Museum in Warsaw
Keywords: Gun flints, experiments
Presentation Preference: Oral

Polish - Russian War 1830-31 also known as the November Uprising was a rebellion against the Russian Empire. After the first military successes, the rebellion was eventually crushed by Russian Army. The war was finished by the capture of Warsaw on 6th of September 1831 by Russian troops. During the battle of Warsaw, one of the famous episodes was associated with defending two of fortified redoubts. One of them was called The Ordon's Redoubt. The siege lasted only for two hours and ended after heavy artillery bombardment followed by infantry attack on fort.

The archaeological excavations were conducted on the Ordon's Redoubt in 2010, 2011 and 2013. During this fieldwork an outlines and remains of the moat, shafts and wolf pits contained common graves of soldiers were discovered, together with the small items including flintlock packages - gunflints and firesteels. There were also gunflints funded on the battlefield area. All of these finds were standardized gunflints made out of blades, which represent different stages of wear.
Basing on finds from the Ordon's Redoubt we prepared the experiments associated with the preparation and shooting with the use of gunflints. Our research was focused on two aspects of morphological features - macro and micro-wear traces. We created a reference base, to get the information about the traces of striking, gunpowder and mounting in caps located at various parts of items. During the experiments, we made an attempt to compare different materials and models of caps with certain traces. We estimated the maximum number of effective shots and we compared to the number of rifle charges equipped each soldier. As a results of our comparative studies we gained the detailed data concerning on finds from the Ordon's Redoubt.

07 A GUN FLINT PLACE AT MASNUY-SAINT-JEAN (JURBISE, PROV. HAINAUT, BELGIUM)

Author: Dr. Hauzeur, Anne - Paléotime (Presenting author)
Co-Author: Prof. Trnka, Gerhard - University of Vienna; Dr. Brandl, Michael - Austrian Academy of Sciences; Ms Collet, Hélène - Service public wallon
Keywords: Belgium, gunflints
Presentation Preference: Oral

One of the huge workshop place to extract and make gun flint was settled by the French 'caillouteur' M. Bigaud, during the years 1820, at Masnuy-Saint-Jean. The flint quality there belong to Lower Turonian and made this place one of the biggest place known in the surrounding of Mons city.

In 2013, opportunity was made to rediscover those workshops in a private ownership. Evidences of quarrying and knapping can be observed. As J. Breuer wrote (1957), extraction features are now a pond, but hips of flakes and debitage products are still visible. They are several meters large and high, containing hundreds of thousands of typical blades remains and cores. Blanks were obviously prepared there when the gun flints themselves were finished elsewhere, at home nearby according to custom.

This workshops belong to the 19th productions for providing the French army, with concurrence to the 'French blonde' made in the Meusnes area (Dpt. Loir-et-Cher, France).

317 URBAN ENCOUNTERS – THE MATERIALITY OF MEETINGS IN PRE- AND EARLY MODERN TOWNS

Theme: 6. Interpreting the archaeological record
Author: Dahlström, Hanna (Denmark) - Aarhus University; Museum of Copenhagen
Co-Author(s): Haase, Kirstine (Denmark) - UrbNet, Aarhus University; Odense City MuseumsWynne-Jones, Stephanie (United Kingdom) - Department of Archaeology, University of York
Keywords: identities, migration, materiality, social-practices, temporality
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

MERC
Medieval Europe Research Community

People meet in towns in many capacities. They move to towns, move out, and visit towns on a more or less regular basis. Urban life and activities – daily life, trade, production, moving about - require more interfaces towards other people, who are not kin or near acquaintances. Meetings and cooperation with strangers on a daily basis becomes the norm. One could argue that the multitude of encounters between people in different roles is characteristic of towns, certainly in present-day but also from the very beginning of towns. In towns, the world comes closer.
Seeing the town as a facilitator or catalyst for meetings between people provides a perspective on urbanity that puts people, their motivations and experiences in focus. This is an aspect of the study of pre- and early modern urbanism that holds great potential but is in need of further attention. In this session we want to explore how urban encounters materialised and how they played a role in past people's lives, for the development of urban identities, for the character of life in the growing towns and for the development of an urban ethos.
We invite contributions which use material culture to address social, material, economic or other aspects of urban encounters – focusing on the effects of these encounters. Case studies as well as theoretical takes on the theme are welcome.

01 NEW NEIGHBOURS IN TOWN

Author: Associate Professor Hansen, Gitte - University of Bergen (Presenting author)
Keywords: Neighbours, migrants, artifacts
Presentation Preference: Oral

Medieval towns were, as other urban communities, reliant on migrators to uphold the population number. People from both near and afar came to town, to work and live there. The migrants had various social, ethnic and geographical backgrounds. Did the newcomers take measures to fit in? Did they become good neighbours? These issues are discussed with a point of outset in material culture from early and high medieval Norwegian towns. Personal accessories, food culture, household inventory, building culture and waste disposal routines are assessed.

02 GLASS SHARDS, FOOD WASTE AND A MISSING FINGER – MATERIAL REMAINS OF ENCOUNTERS IN A LATE MEDIEVAL HOUSE

Author: Mr Aalto, Ilari - University of Turku; Aboa Vetus & Ars Nova Museum (Presenting author)
Keywords: buildings, space, materiality
Presentation Preference: Oral

This paper approaches the question of urban encounters through the archaeological finds and stratigraphy of a medieval stone house in Turku (sw. Åbo), Finland. Today the ruins of the building under study can be seen in Aboa Vetus & Ars Nova Museum, and they have been excavated by several teams between 1994–2015. This stone house was built in the early 15th century and abandoned probably in 1653. The owners of the house are known from the 1580s onwards, but the preceding 200 years can only be studied through archaeological material.

It's evident that the house has witnessed several changes throughout its period of use. In this paper I will examine how the archaeologically evident alterations in the stone house and the find combinations reflect the house's role as a place for encounter. It would seem that in its early phases the house functioned as a semipublic space – a tavern or a public sauna. This is evidenced by possible remains of sauna stoves, find material consisting of broken glass and stoneware vessels and kitchen waste.

Taverns and public saunas were the places where townsmen and travelers alike would encounter each other in a relaxed manner. They were however also places where conflicts could arise. A human finger discovered in the basement of the house might be evidence of such a case.

03 GREETING FRIENDS, MEETING STRANGERS: VOLATILE ENCOUNTERS IN THE MEDIEVAL TOWN OF AARHUS

Author: Curator Linaa, Jette - Moesgard Museum (Presenting author)
Keywords: Encounter urbanity consumption
Presentation Preference: Oral

The movements of people is a burning topic in the present, but still severely underdeveloped within Scandinavian historical archaeology. Much has been written based on a town as structures and institutions; a place where fortifications were planned, buildings constructed, streets laid out and goods flowing to and from, all seemingly untouched by human hands. This has happened although documentary sources makes is abundantly clear that masses of migrants: foreighners and locals alike, moved to and from our towns all through the middle ages; some staying for decades, some departing quickly. This has demonstrated, that the towns were not the stable places we thought, but whirling, chaotic spaces of constant change. The knowledge of the volatile encounters in the medieval town is a severe challenges our urban archaeology, because how are we to grasp any of this constant movement in our material record? How do we address this Gordian knot of place, people and materiality? The aim of this paper is to put forth insight into urban encounters from a recently published research project, the "Urban Consumption" project, on the medieval town of Aarhus; a project aimed at a study of meetings between fluctuation communities of merchants and craftsmen, beggars and poors, living together within the boundaries of a medieval town.

04 THE ST. CLEMENT'S CHURCH IN TRONDHEIM: RELIGIOUS SPACE AS FACILITATOR FOR THE FORMATION OF URBAN IDENTITIES IN EARLY MEDIEVAL NORWAY

Author: Petersén, Anna - NIKU - Norwegian Institute for Cultural Heritage Research
Co-Author: Sæhle, Ingeborg - NIKU - Norwegian Institute for Cultural Heritage Research (Presenting author)
Keywords: Norway, Early Medieval
Presentation Preference: Oral

Through a case-study of the newly found St. Clement's church in Trondheim, this paper seeks to investigate whether the role of religious space in Early Medieval Norway could have acted as a facilitator for the creation of urban identities that transcended ethnic and national boundaries.

In the late 10th and early 11th centuries, aspiring kings Olav Tryggvason and Olav Haraldsson established Christian churches connected to two important coastal settlements in Norway; Oslo and Trondheim. These settlements represent some of the earliest urban centers in Norway, and the churches built there were closely connected to the kingly estates. Other than their dedication to St. Clement, little is known about the architecture and design of these earliest urban churches. The kings brought with them their own priests and clergy from Anglo-Saxon England, and both the architecture, the liturgy, and the relic cults associated with these churches must have represented an exotic and foreign element in the daily lives of local Norwegians. I will discuss in this paper whether the profound "otherness" of these continental customs and peoples were accepted and integrated into urban life primarily due to their connection to Christianity, which to some degree would have represented a unifying factor in Early Medieval society. This is especially relevant for Trondheim, where, after Olav Haraldsson was declared holy in 1031, the St. Clement's church became a site of pilgrimage – drawing pilgrims from all over Europe and thus creating a city with multi-ethnic impulses, founded in large on the cult of St. Olav.

05 THE PRODUCTION OF URBAN SPACE – THE CASE OF KALMAR, SWEDEN

Author: PhD Larsson, Stefan - National Historical Museum (Presenting author)
Keywords: Urbanity, performativity, encounters
Presentation Preference: Oral

A town is a human artifact, an agglomeration of social spaces, in different scales and levels. The 20th century archaeological tradition has provided formal descriptions of 'the town' as a phenomenon but held limitations concerning explaining change, modifications or renegotiations in ways other than descriptive, or confirmative of, and subordinated to, a processual historicism. Our archaeological conception of towns was to a large extent limited to understanding, presenting and reproducing them in terms of mere material and architectural facts and as the outcome of the one-sided, single-acting ecclesiastical or royal will-to-power. More recent works have, however, emphasized the performative aspects of towns and cities, leading to a renewed interest in social agency, materiality and the production of space. By adapting established theoretical frameworks, towns of the past can be understood as sets of habitus and distinctive (spatial) practices that, amongst other things, organized encounters between humans, things (in a wide sense) and spatial representations, constituting the urban as a concept. This theoretical platform appears to open up for a somewhat different discussion on the urbanization of Scandinavia. Based on recent work on the Swedish town of Kalmar, some suggestions on how this particular distinctive representation of space can be 'read' as the introduction and paradigmatic 'gestaltung' of a new social concept, will be presented.

06 MATERIALISED ENCOUNTERS: THE ARCHAEOLOGY OF CONTACTS AND URBAN IDENTITY FORMATION IN 13TH-CENTURY TARTU, ESTONIA

Author: Mr Haak, Arvi - Tartu City Museum (Presenting author)
Keywords: urban archaeology, idenitity
Presentation Preference: Oral

Following the crusade in the early 13th century, the formation of a medieval town integrated to the Hanseatic cultural sphere started in Tartu. The existing written and archaeological data confirm the involvement of settlers of German, Russian and local background. In addition to discussing the exiting archaeological evidence (both a selection of finds and building remains), the paper concentrates on the material culture of the forming urban centre. The following questions are addressed:

1) How did the "urban" material culture of the newly-established 13th-century town differ from that of the rural? Beyond the self-evident features like greater density of occupation, greater access to imported goods, etc., there is good evidence for the evolving urban consumption pattern. Several examples are discussed;

2) Can we distinguish between living quarters of social groups of differing ethnic background? The preliminary analysis of the collected material allows suggesting that the indicators of 'Hanseatic' consumption pattern are significantly weaker on the outskirts of the town. The presumed Russian quarter on the northern edge specifically stands out. This leads to the assumption that during the 13th century, the ethnic groups that later formed the town community may have geographically distinct habitation areas, which also contributed to the patterning seen in material culture;

3) Is there a way to connect such patterning with identities? While several of the indicators are time-specific, and the theoretical contributions have shown that broad generalisations on such issues are unhelpful, focusing on the 13th-century contexts allows addressing contacts and change, considering the existing theoretical framework.

07 DIRTY CITIES, DIRTY NEIGHBOURS: THE ROLE OF SANITATION IN URBAN IDENTITY

Author: Mr O\'Meara, Don - Historic England (Presenting author)
Keywords: Sanitation England Environment
Presentation Preference: Oral

The movement of people from rural to urban environments places increasing limitations and restrictions on space; restricting the social space between non-familial individuals in a manner that may not be familiar in rural settlements. This pressure on interpersonal private spaces increases with the increasing size of a settlements, but can be varied by economic status, and urban geography. One locus which can lead to interpersonal engagement (either for cooperation or conflict) is the provisioning of sanitation: the supply of clean water and the removal of waste materials. This infrastructure is fundamentally constrained and regulated in urban environments by population density, geography and the natural environment. The examination of legal documents relating to petty legal disputes in medieval England demonstrates that sanitation related issues feature very commonly in urban records, while archaeological remains can reveal the nature and extent of remains not present I historic documents.

This paper will argue that the infrastructure of sanitary arrangements, and the material associated with these deposits, are artefacts of human interaction on both the household level, and at a wider intra-household and city wide scale. It proposes that sanitary infrastructure (such as cesspit remains) be considered not only as repositories for artefactual or ecofactual remains but as points of potential interaction, either within a household, or between households, and either as sources of cooperation or as sources of conflict.

08 ENCOUNTERS ON THE MARKETPLACE IN LIGHT OF CHOSEN ARCHAEOLOGICAL FINDS. CASE OF NEW MARKET SQUARE IN WROCLAW.

Author: Dr Sawicki, Jakub - AU - Institute of Archaeology of the Academy of Sciences of the Czech Republic (Presenting author)
Keywords: medieval material culture
Presentation Preference: Oral

Wrocław is the historical capital of Silesia, the largest city in the region and, in archaeological terms, one of the most thoroughly studied urban complexes in modern Poland. In 2010–12 on the Nowy Targ Square (New Market Square), rescue excavations covering approximately 0.4 ha were conducted, recording more than 4 m of stratified deposits. The remains of an early medieval settlement (of the 12th century) were recorded as well as the remains of a settlement with timber-framed buildings and wooden communication paths, dating to the mid-13th century. In the second half of the 13th century, and more specifically around 1266, as confirmed by historical sources, the market square was located in this area.

During those excavations thousands of artifacts were recovered. They are material evidence of different types of relations between humans, items and urban space. Their study cover such topics as a long distance trade, pilgrimages or local production. A large number of finds from one place allows us to more easily observe things that are new or more luxurious in this part of Europe and how it influence the identity of inhabitants of the city.

The exact place of discovery of those artifacts also shows how this public part of the city was organized, where were possible routes and paths and how people moved over market square. It also allows us to identify places of encounters, for instance in parts associated with water management.

09 'PRE-MODERN TANGIER DATASET VER. 2.0': THE MÉDINA AND ITS MICRO-REGION, AS ENCOUNTER SPACE, MILITARY FRONTIER NODE, AND CROSS-CULTURAL SITE

Author: Elbl, Martin Malcolm - The Portuguese Studies Review / Baywolf Press / Trent University (Presenting author)
Keywords: Tangier, database, urbanism
Presentation Preference: Oral

The paper presents a snapshot of Stage 2.0 in development of a cumulative urban / suburban spatial database and detailed diachronic GIS model for the fortified médina of Tangier (northern Morocco) and its immediate hinterland. Part A of the dataset -- about to be released in a simplified version in 2017 -- reaches from the early sixteenth century through 1683-84. An extension into the eighteenth- and earlier nineteenth-century Consular Period (Part B) is in progress. In Version 2.0 the database reaches down to street and house level. Tangier constitutes a near canonical example of an urban center and maritime port that functioned as one of the key nodes of a military and inter-faith frontier (the Strait of Gibraltar). The town transited from an Islamic identity (pre-1471) to a Portuguese one (1471-1662), then an English one (1662-1684), and back to an integral Islamic framework after 1684. The latter was then diversified and partly overlaid by gradual external influences and investments from c. 1770 to 1840. The most recent additions to the database modules have focused on an analysis of the use of space, of public thoroughfares, of land ownership, and of commercial / non-commercial habitat during the English period. The paper presents new preliminary results on patterns of continuity, discontinuity, and space usage / allocation changes across the major urban fabric "stress points" -- 1471, 1662-1673, 1684, and then resettlement combined with post-1684 Islamic urbanization. The database, the first of its kind for Tangier at the current resolution and data density, accommodates known historical maps and surveys, current archaeological data, data from in situ street grid checks (walk-around GPS corrections), as well as ongoing architectural restoration information. The project is unfolding under an exchange of information protocol with Patrimonium SARL (Rabat, Morocco).

10 A PARASITOLOGICAL VIEW ON URBAN ENCOUNTERS

Author: Dr. Rieger, Dirk - Archäologie Hansestadt Lübeck
Co-Author: Dr. Flammer, Patrik - University of Oxord, department of Zoology (Presenting author)
Keywords: parasites, urban, archaeology
Presentation Preference: Oral

During a seven year lasting UNESCO excavation campain in the Old town of Lübeck more than 40 medieval plots were investigated. This work had been carried out in the heart of the later capital of the Hanseatic League in between the harbour and the market place. Within this large-scale project more than 90 infrastructural features of cesspits and toilets from the 12th to 15th century CE were unearthed. Samples of infills and depostis from the major ones were taken and analysed. Faecal-oral transmitted nematodes (Ascaris lumbricoides and Trichuris trichiura) were ubiquitous. In contrast to other sites examined parastiologically, Lübeck showed uncommonly high numbers of food-associated cestodes (Diphyllobothrium latum and Taenia saginata). Furthermore, both exhibited time-dependent distributions indicating changes in diet or parasite availability c1300CE. aDNA sequencing enabled species identification and provided a powerful resource for molecular epidemiology. Sequence diversity of T. trichiura ITS-1 revealed two clades; one ubiquitously distributed and one restricted to medieval Lübeck and Bristol. Phylogeographic analysis suggested directional transfer of parasites from Lübeck to Bristol. This paper will provide a yet unseen sight on medieval urban encounters from the viewpoint of a parasite.

11 THE HARBOUR ZONE OF COPENHAGEN, MEETING PLACE & HABITATION AREA, 1350-1700.

Author: Curator Whatley, Stuart - Museum of Copenhagen (Presenting author)
Keywords: Social-identity, materiality, networks
Presentation Preference: Oral

The aim of this talk is to discuss the harbour zone of Copenhagen in the Medieval and Early Modern period which functioned not only as an area of inhabitation but as a meeting place, due to trade, contact and movement of people into Copenhagen. The harbour zone was, for many years of its existence, not only the southern boundary of Copenhagen but the boundary zone for the Oresund, the Baltic Sea, Europe and the world. It has become an important case study area as the boundary location was never constant, slowly moving southwards, as seen from the dendrochronological dates of each bulwarks phases. Parts of this new reclaimed land became inhabited by elites of the society such as merchants, councilors and the royal court. The other key aspect of the border was the economic aspect as it was bounded to the north by the markets and to the south by Royalty on Castle island and contained the maritime tax buildings of the city, and Denmark, as the capital city harbour.
We have seen from excavations in the harbour zone that between every 30-70 years a new harbour was constructed, and behind the new harbour, new land was created using rubbish from the city. The finds from the land reclamation show the story of trade in Copenhagen and how the trade affected society over time, which, by the 1600s, had obtained global links and led to an intense period of expansion and urbanization of Copenhagen. As well as observing change in social identity, by studying the finds over a period of time we may also find evidence of diffusion of ideas, networks changing, consumerism and migration, which will be discussed.

12 THE LISBON CONNECTION - TRACES OF WORLD TRADE ROUTES IN 17TH CENTURY GOTHENBURG

Author: Mr Wennberg, Tom - Museum of Gothenburg (Presenting author)
Keywords: tinglazed earthenwares Gothenburg
Presentation Preference: Oral

The period from the 15th century to the 18th century is sometimes called the Age of Discovery and within this time frame the world became connected on a global scale. The Portuguese and Spanish empires where the leading parties in this process during the 15th and 16th century. During the 17th century the British and the Dutch empires also became contenders for the world dominance. The world trade routes became more established and we are now talking about proto-globalization. The term describes the phase of increasing trade links and cultural exchange on a global scale.
The city of Gothenburg where founded 1621 by king Gustavus Adolphus of Sweden with the specific purpose to be a part of this global trade. Gothenburg played a peripheral role in this system of trade routes during the 17th century. There are, however, both written and archaeological evidence of the world trade strongly influencing the inhabitants of Gothenburg. Tobacco, exotic spices and ceramics are typical finds that give evidence for this long distance trade. One of the centers of trade with connection to Gothenburg was Lisbon. The importance of this specific connection has recently become apparent in the archaeological source material.
This presentation will give a brief overview of 17th century Portuguese tin-glazed earthenwares (Portuguese faience) found in Gothenburg, as known of today. Tinglazed earthenwares are fairly common in archaeological 17th century contexts of Gothenburg. The majority of these materials origins from the Lower Countries, but the overall picture are more

complex. Recent studies have shown that Portuguese tin-glazed wares have reached Gothenburg in a larger extent than known before. Several excavations shows as much as 25 % of faience with Portuguese origin. This presentation will give some examples of these wares and explain why we find them in a Gothenburg 17th century context.

13 'FAR FROM THE BARBAROUS MANNERS OF ANCIENT PIRATES': URBAN DINING PRACTICES IN EARLY MODERN DALMATIA

Author: Garwood, Samantha - The University of Sheffield (Presenting author)
Keywords: Dalmatia, Renaissance, tableware
Presentation Preference: Oral

During the 15th through 18th centuries, the Balkans were the frontier between Venetian, Habsburg, and Ottoman spheres of power. Despite frequent conflicts across these boundaries, the towns and cities along the Dalmatian Coast were ports actively involved in international trade, particularly between Asia and Europe. As such, these places were also home to the literature, art, and architecture of the Renaissance and the Enlightenment, influenced in part by Venetian colonial rule. This helped to create a divide between the urban population and their neighbours—both the rural, pastoral peasants of the Dalmatian hinterland (many of whom had recently migrated there from other parts of the Balkans), and the Ottoman subjects on the other side of the nearby border. Well-mannered city-dwellers, semi-nomadic peasants, and so-called 'barbaric' raiders were all exposed to the scrutiny of peers and also outsiders.

The consumption and display of material culture was a way of asserting one's social and cultural identity at a time when many Europeans were assessing their place in an ever-expanding world. This was a time when the circulation of new types of materials and foods sparked changes in social practices. The skillful navigation of these new fashions and rituals marked one out as having good taste, while adhering to older or seemingly 'Eastern' traditions could be seen as backwardness. Through the study of the goods traded and used in Dalmatian cities—especially glass and ceramic tableware—we can gain insight into the international trade of goods and foodstuffs, social class divisions, ethnic or religious divisions, and the rules of social etiquette (both imported and home-grown) of this region.

321 MARINE MAMMAL EXPLOITATION FROM A DIACHRONIC PERSPECTIVE

Theme: 6. Interpreting the archaeological record
Author: Glykou, Aikaterini (Sweden) - Archaeological Research Laboratory, Stockholm University
Co-Author(s): Gotfredsen, Anne Birgitte (Denmark) - University of Copenhagen, Zoological Museum
Keywords: marine mammals, exploitation, human subsistence
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

According to archaeological research, seals, whales and dolphins have been exploited by humans through time, although exploitation patterns and intensity have varied greatly between regions, time periods and cultures. The focus of this session, inspired by the newly formed ICAZ (International Council of Archaeozoology) Marine Mammal Working Group (MMWG), will be human-marine mammal interrelations from a diachronic perspective. Human subsistence, hunting strategies, seasonal use of coastal catch sites and the utilization of marine mammals as resource supply varied over time. This might be due to cultural reasons, for instance human perception of hunting. Moreover, hunting pressure, habitat alteration and environmental changes might have had an impact on the abundance, accessibility, ecology and social behavior of various marine mammal species. We aim to bring together researchers who work with marine mammal exploitation and discuss how and why exploitation patterns change over time and how that is reflected in the archaeological assemblages. The session is open for papers presenting various methodological approaches, osteological and osteometrical analysis, ancient DNA, multi-stable isotopic analysis, histological analysis on teeth/bones - which address interactions between humans and marine mammals in the past.

01 WHERE DID THE SEAL COME FROM? SEQUENTIAL MICROSAMPLING ON PREHISTORIC SEAL CANINES FROM THE BALTIC SEA REVEALS STRONTIUM ISOTOPIC VARIATIONS

Author: Dr. Glykou, Aikaterini - Department of Archaeology and Classical Studies, Stockholm University (Presenting author)
Co-Author: Dr. Eriksson, Gunilla - Department of Archaeology and Classical Studies, Stockholm University; Dr. Andersson, Per - Department of Geosciences, Swedish Museum of Natural History; Dr. Storå, Jan - Department of Archaeology and Classical Studies, Stockholm University; Schmitt, Melanie - Department of Geosciences, Swedish Museum of Natural History; Dr. Kooijman, Ellen - Department of Geosciences, Swedish Museum of Natural History; Dr. Lidén, Kerstin - Department of Archaeology and Classical Studies, Stockholm University
Keywords: Strontium, seals, Baltic
Presentation Preference: Oral

Strontium isotope ratios (87Sr/86Sr) in marine environments are considered to be homogeneous averaging 0.7092. However, in the Baltic Sea there is major influx of freshwater, since more than 50 rivers discharging into the Baltic drain sedimentary rock-bearing areas of the Baltic Shield with different geological origin and thus different strontium isotope ratios. This results in mixing of sea water and continental drainage, leading to regional variations of strontium isotopic ratios. The aim of this pilot study was to explore if these regional variations of Sr can be detected in marine mammals from archaeological sites in the Baltic Sea. This was investigated by performing a sequential measurement of 87Sr/86Sr ratios in tooth enamel from three seal species by using laser ablation MC-ICP-MS. An inter-tooth 87Sr/86Sr variation can be detected in marine mammals that lived in the Baltic Sea, suggesting that different Sr ratios can be detected in different regions of the Baltic Sea. Furthermore, an intra-tooth variation suggests possible different geographic origin or seasonal movement of seals within different regions in the Baltic Sea through their life time. The data show clearly that we deal with a non-homogenous strontium isotope ratio in the Baltic Sea Basin. Archaeological implications are discussed.

02 ARCHAEOLOGY AND ANCIENT GENOMICS OF BALTIC HARP SEALS

Author: Bro-Jørgensen, Maiken Hemme - Stockholm University; University of Copenhagen (Presenting author)
Co-Author: Glykou, Aikaterini - Stockholm University; Professor Lidén, Kerstin - Stockholm University; Olsen, Morten Tange - University of Copenhagen
Keywords: aDNA, Pagophilus groenlandicus
Presentation Preference: Oral

This newly started PhD project investigates questions related to the genetic composition of the ancient harp seal population in the Baltic Sea in a diachronic perspective. From an outstanding zooarchaeological collection of harp seal bones, ancient DNA will be extracted and analyzed in order to investigate the colonization history and geographical origin of the harp seals in the Baltic Sea, and to assess genetic, life history and demographic processes associated with the gradual decline and extinction of harp seals in the Baltic Sea.
Today the harp seal is a subarctic pelagic species, which depend on pack ice in order to breed. For that reason their presences in the Baltic Sea during the middle Holocene have been much debated and many questions still remain unanswered. Firstly, it still remains unclear whether climate or human overexploitation was the main driver of the presumed extinction of the Baltic harp seal. Secondly, it is still not known from where the harp seals that colonized the Baltic originated from and whether multiple colonization events took place. Another unanswered and interesting observation is the significant reduction in the mean body size of the Baltic harp seals from the warmer Atlantic to the cooler period of the Subboreal, which is likely to be a sign of genetic isolation from the Atlantic population leading to higher levels of inbreeding or local adaptations.
We expect that from a comparative-genetic analysis of the samples, we will by some level of confidence be able to pinpoint the most likely ancestral population of the Baltic harp seals and tell whether a single or multiple colonization events occurred. We also aim to provide information on the relative effects of climate and human exploitation on the extinction of the Baltic harp seal.

03 MEDIEVAL WALRUS HUNTING: ECOLOGICAL, ECONOMIC AND SOCIAL PERSPECTIVES

Author: Dr. Barrett, James - McDonald Institute for Archaeological Research, University of Cambridge (Presenting author)
Co-Author: Dr. Star, Bastiaan - Department of Biosciences, Centre for Ecological and Evolutionary Synthesis, University of Oslo; Dr. Boessenkool, Sanne - Department of Biosciences, Centre for Ecological and Evolutionary Synthesis, University of Oslo
Keywords: walrus, medieval, globalization
Presentation Preference: Oral

This paper introduces preliminary results from a three-year collaborative project on medieval walrus hunting, in which the trade of ivory and other walrus products is used as a proxy for globalization and its ecological impacts. The research is compiling a time-space map of archaeological walrus finds in Europe, and using ancient DNA and stable isotope analysis to ascertain where the original animals were likely to have been caught. Typological analysis of ivory and bone artefacts complements this bioarchaeological research, and it is also informed by rare (but evocative) historical accounts of hunting and trade. Much has been written about the medieval walrus ivory trade, inspired by exceptional artefacts such as the Lewis Chessmen, but surprisingly little research has focused on the many known (and previously unknown) archaeological finds from across Europe. Innocent misidentifications have also been propagated in the published literature. Through cooperation with national and regional museums, and the integration of archaeological science, this work aims to provide an empirical basis for the study of medieval walrus hunting. It will have implications for our understanding of indigenous hunting in the far north, the growth of long-range trade in medieval Europe, the social use of exotic materials and the population history of the walrus itself. The research contributes to a new efflorescence of circumpolar research on the archaeology and ecology of sea mammals.

04 CETACEAN EXPLOITATION IN MEDIEVAL LONDON

Author: MR Van den Hur, Youri - University College London (Presenting author)
Keywords: Zooarchaeology, Cetaceans, Whales
Presentation Preference: Oral

Zooarchaeology aims to reconstruct the relationship between humans and animals based on the bone remains of these animals. However the field is often primarily concerned with (domesticated) terrestrial mammals, frequently neglecting cetaceans. This can be ascribed to the fact that zooarchaeological cetacean remains are often too fragmented for identification and a general lack of extensive cetacean reference collections for comparison, resulting in poor understanding of early human-cetacean relations.
Numerous medieval sources mention the exploitation of cetaceans in the United Kingdom, including London. These sources often mention that the exploitation and consumption of cetaceans was restricted to the social elite. London was already a large city in the medieval period and at numerous archaeological sites have cetacean remains been uncovered. These remains are often fragmented and have been neglected and understudied so far. By examining these remains and performing ZooMS (Zooarchaeology by Mass Spectrometry) an attempt will made to see which species were exploited and whether their consumption was indeed restricted to the social elite, as stated by the medieval sources.

05 SEAL EXPLOITATION IN SE BALTIC DURING 3900-2300 CAL BC

Author: Dr Piliciauskiene, Giedre - Vilnius University (Presenting author)
Co-Author: Dr Scmölcke, Ulrich - Centre for Baltic and Scandinavian Archaeology; Dr Piliciauskas, Gytis - Lithuanian Institute of History
Keywords: Baltic, seal, Subneolithic
Presentation Preference: Oral

This presentation is based on the research of osteological material from 10 Lithuanian coastal Subneolithic-Neolithic sites. Šventoji sites are of supra-regional importance due to brilliant preservation conditions and degree of research done. Many of ca. 60 sites are wetland sites with waterlogged archaeological layers. Some of them are contemporaneous and represent highly elaborated settlement systems with dwelling areas and amber workshops on the eastern bank of the ancient lagoonal lake and fishing stations found within lacustrine and alluvium sediments. Large-scale seal hunting and freshwater fishing were inferred alongside the very sparse and dubious signs of a Neolithic farming economy in the Šventoji region. Bone collagen stable isotope analysis combined with zooarchaeological data demonstrate seals being of high importance to coastal Subneolithic people. In 2016 seals bones from various Šventoji sites were reanalyzed with an aim to get more detailed data about seal exploitation. Significant differences in seal species and ages became apparent among several sites. This may be explained by differences in site chronology, function and seasonality. We also present some indications of specific seal butchering traditions.

06 PREHISTORIC EXPLOITATION OF GREY SEAL (HALICHOERUS GRYPUS) IN DENMARK – THE ARCHAEOZOOLOGICAL EVIDENCE.

Author: Ph.D, post doc Gotfredsen, Anne Birgitte - Natural History Museum of Denmark, University of Copenhagen (Presenting author)
Keywords: Grey seal exploitation
Presentation Preference: Oral

The present paper explores the role of the grey seal (Halichoerus grypus) as a marine resource of prehistoric Mesolithic hunter-gatherers through the transition to Neolithic farmers and subsequent cultures at Danish coastal sites. The archaeozoological record of seals indicates that grey seals from their first appearance around 8000 – 6000 BP, until their extermination as a breeding species in Danish waters during historical time, have been the most abundant seal species at Danish archaeological sites, both in terms of occurrence and relative frequencies. Previous studies have only focused on presence/non presence of seal species and establishing chronological data, but neglecting relative species frequencies within the entire body of seal remains. The present study presents grey seal remains from more than 100 sites addressing relative abundance, demographic distribution as well as butchery analyses and seasonal hunting patterns. These analyses allow us to evaluate the interactions between people of shifting prehistoric cultures and seal populations and relate the apparent shifts in grey seal abundance to climatic as well as humanly induced impacts on the seal populations.

07 MARINE MAMMAL HUNTING AT STORA KARLSÖ IN THE BALTIC SEA C.9200-7600 CAL BP.

Author: Prof Stora, Jan - Stockholm University (Presenting author)
Co-Author: Ass Prof Apel, Jan - Department of Archaeology and Ancient History, Lund University
Keywords: Baltic Sea, Seals
Presentation Preference: Oral

The Mesolithic pioneer settlements reached Gotland c.9200 years ago when the Baltic Sea was at the end stage of Ancylus Lake with fresh water. The archaeological record show that marine mammals were important prey for the mesolithic hunters, mainly grey seal and ringed seal. At the cave site Stora Förvar on the small Island of Stora Karlsö, located off the west coast of Gotland it is possible to follow the development of hunting patterns for seal during the period between 9200-7600 cal BP. The lime-stone bedrock of the cave have provided excellent preservation conditions for bones and, thus, prerequisites for osteological analyses. During the period in focus Gotland experienced marked changes in the environment associated both with the transition of the Baltic Basin to the Litorina Sea but also to more general climatic trends. Our analyses of the seal bones from the cave show that hunting patterns changed through time both regarding the species hunted but also the seasonality of the hunting. We here consider and discuss possible reasons for the changing hunting patterns.

08 BETWEEN THE FORAGING AND FARMING: SEAL EXPLOITATION BY THE BRONZE AGE COMMUNITIES OF SAAREMAA ISLAND, ESTONIA

Author: Dr Wojtal, Piotr - Institute of Systematics and Evolution of Animals, Polish Academy of Sciences; Sławkowska 17, 31-016 Kraków, PolandDr Lõugas, Lembi - Archaeological Research Collection, Tallinn University, Rüütli 10, 10130 Tallinn, Estonia
Co-Author: Dr Wilczyński, Jaroslaw - Institute of Systematics and Evolution of Animals, Polish Academy of Sciences; Sławkowska 17, 31-016 Kraków, Poland (Presenting author)
Keywords: seal, taphonomy, Estonia
Presentation Preference: Oral

Humans and seals have a long and varied history of interactions across the Baltic Sea. The cultural values placed on seals has changed dramatically over time. For early settlers in many regions, seals formed a crucial part of human survival and were valued for the meat and skins that hunting them provided. However, after the introduction of farming into the islands, the role of seal hunting began to diminish. Still in cold winters the fat rich meat provided by seals was essential at the Bronze Age (BA). In this paper we focus on the introduction of taphonomic analysis conducted on seal bones from the BA settlement sites of Saaremaa island, Estonia. Comparing with the regional diversification of the economic strategies in Bronze Age Europe the Estonian case offers an exclusive example of the adaptability of prehistoric people – as for regions with less convenient climate conditions. The sites of Asva and Ridala illustrate the knowledge and skill applied in order to arrange food surplus and local craftwork there. In these sites seal hunting and fishing formed very important economical activities. Mixed-farming played an eminent role too. Different taphonomic aspects will be performed in discussing the dynamics and strategies in economy of Bronze Age people in areas east of the Baltic Sea.

322 WHAT IS SO SPECIAL ABOUT NEOLITHIC SPECIAL BUILDINGS?

Theme: 6. Interpreting the archaeological record
Author: Dietrich, Oliver (Germany) - German Archaeological Institute
Co-Author(s): Dietrich, Laura (Germany) - German Archaeological InstituteErdem, Deniz (Turkey) - Centre of Research and Assessment of Cultural Environment (TACDAM), Middle East Technical UniversityNotroff, Jens (Germany) - German Archaeological InstituteOross, Krisztián (Hungary) - Institute of Archaeology, Research Centre for the Humanities, Hungarian Academy of Sciences
Keywords: Neolithic, 'Special Buildings'
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Extraordinary features which challenge conventional interpretations are readily denoted as 'special' by archaeologists. 'Special buildings' is an often-used label in Near Eastern Archaeology for constructions deviating in architecture, elaborate inner fittings, finds and often also treatment after the end of use (intentional destruction, burial) from domestic spaces. 'Special buildings' start to exist during the Epipalaeolithic and the Pre-Pottery Neolithic in the region between the Levant and Upper Mesopotamia, well-known examples come inter alia from sites like Göbekli Tepe, Jerf el Ahmar, Nevalı Çori, or Çatalhöyük.
The term 'special building' is not unknown in the European Neolithic, although with a considerably different meaning. In Europe, constructions such as megaliths, earthworks and ditches have been approached in ways similar to the 'special buildings' of the Near East, without labelling them as one group however.
A general approach to this issue is still missing. The essential question is whether by 'special buildings' we are facing a phenomenon common to Neolithic societies which has to be considered another component of the so-called Neolithic Package.
The session follows two main questions:

1. Are there really commonalities between the buildings categorized as special, i.e. is 'special buildings' more than an ill-defined label for the uncommon? Could we converge the information to a common definition?

2. Is there a tradition of 'special buildings' throughout the Neolithic, are they part of the 'Neolithic package' transferred from the Near East to Europe? If so, what elements travel, what meanings change?

01 AN ARCHAEOLOGY OF 'SPECIAL BUILDINGS'? INTRODUCTORY REMARKS

Author: M.A. Dietrich, Oliver - Deutsches Archäologisches Institut (Presenting author)
Co-Author: Dr. Dietrich, Laura - German Archaeological Institute; Dr. Erdem, Deniz - Centre of Research and Assessment of Cultural Environment (TACDAM), Middle East Technical University; M.A. Notroff, Jens - German Archaeological Institute; Dr. Oross, Krisztián - Institute of Archaeology, Research Centre for the Humanities, Hungarian Academy of Sciences
Keywords: Neolithic, Special Buildings
Presentation Preference: Oral

"Similarly archaeologists tend to call buildings, which do not conform to the usual plan of domestic houses, shrines or temples. It is naturally of great interest to trace what we can of the religion of these people who lie so near the beginning of civilization, and there are a number of definite indications." This quote by Kathleen M. Kenyon is one of the earliest references to what later would be summarized as 'special buildings' in Near Eastern Neolithic archaeology, exchanging the words "shrine" or "temple" with an apparently more neutral term.
'Special buildings' has become an often-used label in Near Eastern Archaeology for constructions deviating from domestic spaces in architecture, elaborate inner fittings, finds and often also treatment after the end of their primary use (intentional destruction, burial). This peculiar type of building seems to start existing during the Epipalaeolithic and the Pre-Pottery Neolithic in the region between the Levant and Upper Mesopotamia. Well-known examples come inter alia from sites like Göbekli Tepe, Jerf el Ahmar, Nevalı Çori, or Çatalhöyük. This session introduction will shortly review the characteristics leading to the label 'special' for certain architectonical contexts and provide a common background for a critical discussion of that term. We would like to discuss this phenomenon, the buildings themselves as much as the internal discourse on its conception and terminology, in the frame of this session – raising the question if a structured approach, like Colin Renfrew's "archaeological indicators of ritual", could prove feasible in this context.

02 INTRODUCTION – SPECIAL BUILDINGS IN THE EUROPEAN NEOLITHIC?

Author: Professor Banffy, Eszter - RGK - Romano-Germanic Commission DAI (Presenting author)
Keywords: "sancturaries", European Neolithic
Presentation Preference: Oral

The short introductory paper discusses buildings considered to be fully cult buildings or "sanctuaries" and those regarded as "special" in the South East and central European Neolithic. These terms are used in the European Neolithic mostly to describe constructions with finds regarded as "cultic" but showing no difference in architecture with domestic buildings. The real distinction can rather be made between dwelling houses and a few exceptional constructions which may have served as gathering places.
Central European Neolithic (LBK) settlements are generally north-oriented, with no central space. Thus, early circular ditches can be seen as meeting or gathering places, probably (also) meant for ceremonies.
The introduction will include an analysis of the existing terminology, not only from the point of view of architecture and spaces, but with a particular focus on the agency of "cultic" finds.

03 WHAT IS SO SPECIAL ABOUT EPIPALAEOLITHIC AND PRE-POTTERY NEOLITHIC "SPECIAL BUILDINGS" IN THE REGION BETWEEN THE LEVANT AND UPPER MESOPOTAMIA?

Author: Dr Kornienko, Tatiana - Voronezh State Pedagogical University (Presenting author)
Keywords: Fertile Crescent neolithization
Presentation Preference: Oral

Since the 90-ies of the twentieth century, there has been an ongoing discussion about the role of ideology and religious practices in transition of the Fertile Crescent population to the Neolithic way of life, which became the basis for the development of modern civilization. Thanks to modern methods and technologies of natural science used for working with paleoanthropological, paleobotanical, paleozoological and paleoclimatological data obtained at certain late Pleistocene - early Holocene sites of the Fertile Crescent, as well as for a constant replenishment of the archeological collection of materials, special features of neolithization in various areas of the Near East are currently being considered.
This report examines the role of "special buildings" as an important element of domesticating time and space by early Neolithic people in the central part of the Fertile Crescent. The definition of regional specificity of functioning of Epipalaeolithic and the Pre-Pottery Neolithic special buildings in the region between the Levant and Upper Mesopotamia will enable us to better understand the mechanisms and context of behavioral adaptation of the central Fertile Crescent societies in the transition to a sedentary lifestyle and new economic survival strategies; to clarify the interrelation between environmental, socio-economic and ideological components of the local neolithization processes; and consider the degree of influence of these innovations on the neighboring regions.

04 SPECIAL SPACES, SPECIAL RELATIONS: AN ONTOLOGICAL APPROACH TO PRE-POTTERY NEOLITHIC COMMUNAL BUILDINGS

Author: Dr Fagan, Anna - University of Melbourne (Presenting author)
Keywords: Animism, Ontology, Relations
Presentation Preference: Oral

There are numerous issues associated with applying modern Western binaries of sacred-profane and ritual-domestic to the interpretation of a period within which such a conceptual division would have been surely unimaginable. However, the fact that the numinous shared an equally important role in residential contexts as in the public sphere does not refute the existence of special function buildings within settlements or the existence of sites lacking residential occupancy devoted principally to the performance of ritual practices. Furthermore, the archaeological record of the Pre-Pottery Neolithic reveals that there is good reason to believe that some communities were, in fact, making visible and deliberate distinctions between buildings. This paper asserts first and foremost that the Neolithic world was one that was saturated with powers of sentience and intentionality; as a consequence, all forms of material life harboured agency. However, rather than being a blanket universal property, I consider agency as constituted through the relations into which persons enter. Based on the architecture, depositional practices, and iconography, it appears that very different relations were fostered in 'special function' spaces. Through

the representation of powerful or threatening agencies in imagery, for instance, people set up channels of engagement through which they could interact with potent entities on their own terms, affording a rare degree of controlled interaction in the existentially risky realm of the numinous.

05 PLASTERING RITUALS: CONNECTING BUILDINGS AND BODIES THROUGH PLASTER

Author: Dr. Erdem, Deniz - Middle East Technical University (Presenting author)
Keywords: Ritual, Plaster, Neolithic
Presentation Preference: Oral

Since the Epi- Paleolithic and Pre Pottery Neolithic periods, particular buildings are observed in Levant and Upper Mesopotamia, which are termed as "special". Some of the characteristics, which render these buildings special, can be listed as the over and over plastering of their basements, findings or treatment after the end of use (burning or burial of the buildings). In some of the special buildings, findings with strong symbolic meanings are encountered, like plastered skulls, installations to name a few. All these indicate that these structures have a function related to the conceptual perception of the human beings.
The question arises that if this tradition is spread as a part of the Neolithic package or not, which draws attention to the similar special buildings and plastered basements in West Anatolia. However, a definitive link between the West Anatolian special buildings and the death is not established yet. In this aspect, a common consideration of all the plastered findings, such as buildings, skulls or other small objects is necessary for an understanding of their symbolical meanings and the relation between the plastering traditions appearing on different region.

06 THOUGHTS ABOUT SPECIAL DWELLINGS FROM TELL SETTLEMENT PROXIMITY. SULTANA-MALU ROSU, A CASE STUDY.

Author: Dr. Theodor Aurelian, Ignat - National History Museum of Romania; Bucharest Municipality Museum (Presenting author)
Co-Author: Dr. Catalin, Lazar - National History Museum of Romania
Keywords: Eneolithic, off-tell settlement
Presentation Preference: Oral

The aim of this paper is to explore one special archaeological find in the context of off-tell habitation in the Eneolithic period from the Balkans. Our latest research at the Gumelnița settlement form Sultana-Malu Roșu, Southeastern Romania, we have unearthed the remains of a burnt wattle-and-daub dwelling near the main tell-settlement, which has a series of special features. At first, we were impressed by the size of this building. The destruction level has 17 x 14,8 m and the dwelling itself stretches for about 15,5 m by 12 m. However, the most interesting is the location, because it was found in the perimeter of the Eneolithic necropolis. Moreover, a grave was investigated in the proximity of the dwelling, disturbing the destruction level. Although, we recorded and recovered thousands of small finds, this dwelling is uncommon, because it lacks the rich pottery assemblage specific for burnt Gumelnița structures as the ones found in settlements. Keeping the comparison with the dwellings from the settlement we have noticed that the abandonment level is very thin, and in some parts is completely missing. Usually, this type of action leaves behind a consistent brittle and dusty layer of burnt daub that overlaps the destruction layer. In this particular case, the absence of this layer raises issues regarding the special purpose of this structure as this layer seems to have been swept away intentionally. All of these features - the off-tell location, the presence of this structure in the perimeter of the necropolis, the size of it, the absence of specific abandonment layer and pottery assemblages, and the reuse of the same space for funerary purposes, makes this one very interesting and special dwelling.
This work was performed through the PN II, developed with the support of MEN - UEFISCDI, project no. PN-II-PT-PCCA-2013-4-2302.

325 HISTORICAL MATERIALITY

Theme: 6. Interpreting the archaeological record
Author: Barrett, John (United Kingdom) - University of Sheffield
Co-Author(s): Kim, Jong-Il (South Korea) - Seoul National University
Keywords: Materiality Agency History
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

It has been argued that archaeology should treat things, namely the stuff that archaeologists encounter, not so much as the representations of human actions, nor as if those things only gained their significance as parts of signifying systems, but rather as things with their own integrity and non-verbal qualities. If archaeology is to recognize that all things have different kinds of agency then archaeology must establish what a history of these various agencies might look like. The aim of this session is therefore to inquire if history can be created from the perspective of the particular qualities of things and a competent understanding of materiality, rather than from the perspective of more abstract processes or as the product of a purely human agency. The session will therefore consider if archaeology is now in a position to explore a new tradition of historical writing beyond that of the traditional cultural histories, and the various generalizing principles, of processual and post-processual archaeology.

01 ARCHAEOLOGY'S CONTRIBUTION TO 'BIG HISTORY'

Author: Professor Barrett, John - University of Sheffield (Presenting author)
Keywords: Becoming Energy Information
Presentation Preference: Oral

Archaeology has long been concerned to establish the relationships that once existed between people, things, plants and animals. Those things have been treated as both the contexts in which people once lived and the material consequences of those lives. In this way, archaeology has treated material residues as representing: (i) the organization

and motivations of human behaviour, and (ii) the conditions to which that behaviour was adapted. Archaeology has therefore studied the past as if it were comprised of discrete entities (humans and institutions) and as if it were represented by discrete material entities (the surviving record).
The treatment of the surviving record of material, as if its significance is only that of representing human behaviour, social organizations, conceptual schemes, and so on, has now been questioned. The alternative offered, to analyse all entities as having their own equal significance (referred to as 'symmetrical archaeology'), merely reinforces the idea that archaeology is the study of assemblages of discrete entities that are entangled in relationships one to another.
An outline argument will be presented as follows:
1. Material conditions are states of becoming (rather than states of being)
2. Diversity of material conditions (e.g. what distinguishes living from non-living things) are the orders that emerge through the consumption and dissipation of energy
3. Archaeology is the study of emergent forms of life and their associated materialities that consume energy and are situated in networks of information
4. This approach conforms with various indigenous philosophies and with the Gaia hypothesis

02 TECHNÈ AND POIESIS : AN ALTERNATIVE WAY OF UNDERSTANDING OF ANCIENT TECHNOLOGY AND MATERIALITY

Author: Dr Kim, Jong-Il - SEOUL NATIONAL UNIVERSITY (Presenting author)
Keywords: Metal, Materiality, Technè
Presentation Preference: Oral

From the very beginning of modern archaeology, metal (and metal object) and its materiality has fascinated many archaeologists in many ways, which ranges from production technology involved to its own aesthetic beauty reflected in colour and design. It seems, however, true that metal and its materiality has been not been fully appreciated in archaeology despite much efforts made by many anthropologists such as M. Mauss and Leroi Gourhan and of course by archaeologists, for example, Flankrin (1992), Pfaffenberger (1992), Dobres (2000) and Miller (2007). Instead, metal and its materiality has been scientifically 'analysed' and 'explained', masked by modern concept of technology and thus distanced and separated from its own intricate value.
In this paper, I attempt to re-examine various perspectives on technology in archaeology, and then, developing Dobres' pioneering work (2000) on Heidegger's concept of Technè, I explore an alternative way of understanding of metal (and its production) and its materiality with some examples from different regions and time periods such as Ancient Greece, Central Europe and East Asia, based upon the critical review on the concepts of Technè and poiesis, in which production and use of metal, and its own beauty can be synthetically grasped.

03 NOTES ON HISTORICAL PARTICULARISM AND ITS MEANING IN ARCHAEOLOGY

Author: Dr. Ribeiro, Artur - Christian-Albrechts-Universitat (Presenting author)
Keywords: Particular, general, contextualization
Presentation Preference: Oral

One of the most opaque issues in archaeological theory concerns the role of history. Even though historical explanation was and remains one of the essential elements of archaeological discourse, most archaeological theorists tend to ignore its benefits. This general distrust of history is rooted in a series of false perceptions and misinterpretations concerning how the natural and the human sciences operate.

In this talk, I will focus exclusively on historical particularism and how this idea is misunderstood in archaeology. Traditionally, archaeologists view history in light of concepts which were developed in the hard sciences – a view which makes little sense given that history, as a practice, precedes the hard sciences by several centuries. Moreover, history is commonly conceived as "particular" insofar as it relies on particular facts, as opposed to general facts. This view is wholly incorrect because it presupposes that history operates according to the inductive rule in which "general" conclusions can be obtained from the accumulation of "particular" facts. As against this, I will elucidate that historical particularism is particular because of a practice which is absent in the hard sciences: social contextualization.

In light of this understanding, I will briefly point out why most historians, unlike anthropologists and archaeologists, do not feel the need to engage with "new materialisms", ontological approaches, and relational approaches.

04 TOMBS OF EARTH AND TOMBS OF STONE – DIFFERENT MATERIALS, DIFFERENT HISTORIES

Author: Dr. Ko, Ilhong - Seoul National University (Presenting author)
Keywords: Tombs, Materials, Korea
Presentation Preference: Oral

This paper examines how the use of different materials when building tombs resulted in different histories of construction, use, and abandonment and re-use for these tombs. In particular, the way in which building with stone vis-à-vis earth would have facilitated or constrained certain practices and experiences is considered using several examples of tombs from prehistoric and historic Korea in which either stone or earth was used as the primary building material. The results of the study will demonstrate how the qualities of the respective building materials played an active role in creating the histories of the earthen and stone tombs, as well as the histories of the communities that interacted with these funerary monuments.

05 RE-ASSEMBLING CONTEXT: ARCHAEOLOGICAL THINGS BEYOND OBJECTS

Author: Prof. Dallas, Costis - Faculty of Information, University of Toronto; Digital Curation Unit, IMIS - Athena Research Centre (Presenting author)
Keywords: ontologies, context, thing_agency
Presentation Preference: Oral

Starting from a critical assessment of dominant approaches to the formal representation of the archaeological record, I explore alternative perspectives to archaeological object description – morphological, technological, functional, symbolic – and identify some aspects of the ontological and semantic complexity of representing artefacts, assemblages and sites. On this basis, and taking stock of onto-epistemological approaches from social studies of science, new materialisms, and material culture studies studies, I argue for a shift in conceptualizing archaeological entities (adopting Law's notion of mutable mobiles) whose identification and description needs to account for their historical and epistemic biography. I further discuss how archaeological objects become meaningful and "efficacious" things through their "affiliative powers" (Suchman) and biographical entanglements in cultural activity, spanning across the domains of object vs. subject, conceptual vs. material, and universal vs. particular; and, secondly, I probe on how from

"matters of fact" they become "matters of concern" at the boundaries between scholarship, custodianship, and local knowledge. On this basis, I explore the possibilities of adopting a four-dimensional ontology for archaeological entities re-integrating historical time into archaeological space, of traversing the boundaries between objects to events, and between instances of archaeological things to cultural types seen as interactive kinds (after Hacking). This line of argument is used to revisit conceptualisations of provenance and context (and its articulation with content) in archaeology vis-à-vis relevant ideas in archival science, and to throw critical light on the intellectual foundations, support the pertinence, and probe the limits of event-centric cultural heritage ontologies and information standards such as, notably, the CIDOC Conceptual Reference Model and its applications in archaeological documentation and knowledge representation.

06 THE SOCIAL LIFE OF IMAGERY: VISUAL MODES OF MATERIAL ARTICULATION IN SOUTH SCANDINAVIAN ROCK ART

Author: Ass. Prof. Fahlander, Fredrik - Stockholm University (Presenting author)
Keywords: Rock-art, Materiality, Agency
Presentation Preference: Oral

The paper aims at exploring the generative aspects in the production and use of rock art in south Scandinavian Bronze Age. Traditionally, rock art research have mainly focused on representation and symbolism of the imagery and neglected aspects of materiality and agency. This perspective of primarily studying the imagery as vehicles for meaning or symbolism is here displaced in favour of a greater concern with what imagery in its material form actually does. A key tenet of the project is that rock art imagery has a potential to incite actions and to affect the course of events, rather than being a passive reflection of Bronze Age ideology or cosmology.
This general point of departure is explored by analyzing the varying ways in which new motifs relate to older ones and how imagery of different styles interacts on the panels and in the landscape. By analyzing displacements in stylistic variability, alterations, re-cuts, superimpositions, and breaking against praxis, the potential agency of imagery is emphasized -- that is, how certain motifs may incite actions. From such a perspective, rock art can constitute an active and integrated part in social developments.

07 BODIES LOST IN MATERIALITY AND FLOWS- WHAT PLACE IS LEFT FOR HUMAN REMAINS IN THE 'NEW MATERIALISMS' APPROACHES IN ARCHAEOLOGY?

Author: Dr Ion, Alexandra - McDonald Institute for Archaeological Research (University of Cambridge) (Presenting author)
Keywords: new materialisms, bones
Presentation Preference: Oral

In his paper on 'Archaeology and the New Materialisms,' Christopher Witmore (2014, 204) summarises the main points of his argument in three propositions: '(1) things are assemblages; (2) things are participants; and (3) things are things,' further calling for an 'archaeology without the Past.' Several critiques of these propositions have been raised, along the lines highlighted by Artur Ribeiro (2016), namely is there a benefit of talking 'about objects as if they were some sort of Kantian an sich (the actual)'? For the purpose of this talk, and following the lines drawn by the organisers of this session who ask 'if history can be created from the perspective of the particular qualities of things,' it is my aim to question how are we to talk about human remains if we accept as valid the arguments raised by these new materialistic approaches? In this call for a new way of thinking about the materials (non-anthropocentric and material focused) it seems though that human remains find no clear place (both 'things' and persons). What I would like to explore is how this materialistic turn is a good example of the kind of limitations we hit if we will keep on viewing materials as holding the keys to understanding something about the nature of their being, and by recording the material as if the memory of a (past) identity resides in it. (This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Sklodowska-Curie grant agreement No 701230)

References:
Ribeiro, A. (2016). Against object agency. A counterreaction to Sørensen's 'Hammers and nails.' Archaeological Dialogues (2), 229-235.
Witmore, C. (2014). Archaeology and the New Materialisms. Journal of Contemporary Archaeology (1.2), 203–246.

08 BUDSENE IN THE FLESH – INVOLVING BRONZE AGE WOMEN WITH LIFE AND PRODUCTION OF THE FARM

Author: Dr Hjorungdal, Tove - Department of historical studies; University of Gothenburg (Presenting author)
Keywords: materiality, production, assemblage
Presentation Preference: Oral

This paper addresses the assemblage of female body equipment and animals' bones in the Budsene hoard, Bronze Age Period V, Denmark. This is a tree trunk in a water-well filled with a woman's dress ornaments, spiral arm rings, and bones from farm animals (sheep, cow, horse, dog). As it is an entanglement of a woman's body-related items and farm animals' bodily remains, the find invites new gender informed interpretations. Traditionally the arrangement was interpreted in terms of religious and ritual worlds, seen as the ornaments from a dead woman buried elsewhere (Nordman 1920 ; Kristiansen 1974). As Bronze Age scholars still often relate women to ritual/symbolic spheres it is instead important to stimulate approaches to women as actors in production and economic conditions. We already find inspiration in an innovative approach given by Kristin Armstrong Oma (2010), where she connects Bronze Age women and farm animals as co-producers. As there clearly was a Budsene woman alive, it is my suggestion that she was a co-actor of a next generation who, together with a partner took over the farm production. This was in an undecided time, of prosperity but also of ecological decline partly caused by the previously change from cattle to sheep. The assemblage in the water-well are thus the material traces of the practices carried out when the Budsene woman changed clothes and ornaments, which she possibly had grown up in, and now corporeally went into a new phase of her life, kin and farm. The site exposes the materiality of the process of integrating her bodily as a co-producer to the farm (Hjørungdal 2013).

09 MATERIAL AGENCY AS AN ANTHROPOMORPHIC PERSPECTIVE AND THE PERSISTENCE OF THE SUBSTANCE PARADIGM

Author: Dr Niculescu, Gheorghe Alexandru - Institutul de Arheologie \ (Presenting author)
Keywords: archaeology agents history
Presentation Preference: Oral

The notion of agency as the maker of things tends to reduce agents to capacities, distilled and separated from them, and to flatten the differences among actions, especially when built on property causation. A historical approach to the material, powered by agency theories, should avoid uniformitarian and deterministic accounts and be confronted with requirements advanced by proponents of process ontologies and historical epistemologies.

326 DEVELOPING PROFESSIONAL STANDARDS FOR ARCHAEOLOGICAL FIELDWORK TRAINING

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author: Möller, Katharina (United Kingdom) - Bangor University
Co-Author(s): Majewski, Teresita (United States) - Statistical Research, Inc.Bedin, Edoardo (United Kingdom) - Independent researcher
Keywords: fieldschool, training, teaching, archaeology, europe
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

This session, jointly supported by the Committee on the Teaching and Training of Archaeologists and the Professional Associations in Archaeology Committee, will work towards developing professional standards for archaeological fieldwork training. It follows on from a session on archaeological field schools and the EAA's CTTA's Round Table on fieldwork training at EAA 2016 Vilnius. Both these sessions highlighted that there are significant differences in virtually all aspects related to archaeological fieldwork training, both within and across countries, institutions, and degree programmes even at the same institution. While both CIfA and RPA are providing professional accreditation of fieldwork training, only a few field schools and training courses have been accredited as of yet. The variability of what is on offer in terms of fieldwork training, however, raises considerable questions of how students (or as they are increasingly seen, customers) can assure themselves that what they are signing up for is both living up to professional standards and will provide them with the skills needed (or, indeed, value for money). At the same time, future employers have no way (other than word of mouth) of assessing whether prospective employees received sufficient training in fieldwork to prepare them for a professional career, or whether they need to be trained by their future employers from scratch. This session will bring together papers from the professional institutes about their field school accreditation programmes, best practice papers, and papers critically assessing the difficulties resulting from the currently very patchy and uneven provision.

01 BENEFITING THE CUSTOMER: ALIGNING THE MOTIVATIONS FOR ARCHAEOLOGICAL FIELDWORK TRAINING IN THE UNITED STATES

Author: Dr Majewski, Teresita - Statistical Research, Inc. (Presenting author)
Co-Author: Dr Ciolek-Torello, Richard - Statistical Research, Inc.; Dr Grenda, Donn - Statistical Research, Inc.
Keywords: fieldwork, training, CHM
Presentation Preference: Oral

Archaeological fieldwork training in the United States is offered in various academic programs and increasingly in other venues, but the outcomes in terms of what the student learns are variable. The primary "customer" for archaeologists with fieldwork training is the cultural heritage management (CHM) industry, but others, including the persons receiving that training, also have legitimate interests in the outcomes. Currently, there are over 1,000 U.S. companies needing archaeologists trained in the basics of fieldwork as well as in the new methods and techniques that are now available, applicable laws and regulations, ethical concerns, and the importance of stakeholder outreach, including public engagement. Agencies, nonprofits, research units, and universities also need appropriately trained field archaeologists. This paper explores the needs of CHM customers in relation to accredited training and reviews (1) the extent to which the providers of training are meeting these needs and (2) how professional organizations in the United States are developing standards to ensure appropriate training efforts. A discussion of the effectiveness of U.S. training for archaeologists will be useful in the context of assessing professional standards on a comparative, global scale.

02 UNDERSTANDING SKILLS AND MEASURING COMPETENCE IN ARCHAEOLOGY: FIELDWORK TRAINING IN THE UK

Author: Ms Geary, Kate - Chartered Institute for Archaeologists
Co-Author: Mr Moffat, Bill - Wessex Archaeology (Presenting author)
Keywords: skills, training, fieldwork
Presentation Preference: Oral

In the UK, tools to define and measure archaeological skills and competence developed over the last 10-15 years are just starting to become embedded, at least within the commercial sector, reflecting an increasing awareness of the need to balance academic knowledge with accredited vocational competence. These tools include National Occupational Standards (NOS) for Archaeological Practice, nationally recognised statements which define what a competence person should be able to do across a wide range of vocational areas. NOS provide the building blocks for qualifications which are primarily competence rather than knowledge based.

NOS also underpin CIfA's processes for endorsing fieldschools, training courses, CPD provision and, potentially, the vocational content of academic courses too. Explicitly linking the NOS to CIfA's membership grades means that all endorsed training is directly linked to the appropriate grade of professional accreditation. This paper will expand on CIfAs vision for professional training in the UK as well as giving an employer's perspective on how it works in practice.

03 ADVENTURES IN TRAINING; REFLECTIONS ON A SUMMER OF MOOCS, FIELDSCHOOLS AND VENTURERS

Author: Dr. Forster, Amanda - DigVentures (Presenting author)
Keywords: mooc, fieldschool, accreditation
Presentation Preference: Oral

Founded in 2012, DigVentures is an innovative social enterprise committed to developing and delivering collaborative archaeology projects. We are community-focussed, developing and delivering projects which are designed to maximise public benefit whilst undertaking professional archaeological research. We are accredited by the Chartered Institute for Archaeologists (CIfA), as part of the 'Registered Organisation' scheme, and run embedded fieldwork training within as a key part of our archaeological field projects. We are the first (and at the time of writing, only) CIfA Accredited Field School in the UK, endorsed to deliver NVQ-level training. Our field school curriculum corresponds with the UK National Occupational Standards to enable community participants to gain professional level practical training.

In June 2017 we will launch our Learning Management System, enabling us to deliver online training to our growing community of Venturers (participants who pay to join our projects both online and offline) and other groups. Our first MOOC offers an introduction to practical archaeology, acting as a precursor to joining a fieldschool and providing an insight into what being an archaeologist entails. By the end of the summer, the first of our Venturers will have completed the MOOC, and we will have feedback on both the course

and our bespoke online learning environment. In addition, we will have worked with at least 150 Venturers across six archaeological sites (including our first foray into the USA), with around half of those digging with us also taking part in structured training in the field and online.

This paper provides an informal insight into the DigVentures 2017 summer of fieldschools and online training. The author will discuss the provision of field and web-based training to community participants, comparing the experience of training volunteers with that of training students and employees, and exploring the merits of working within recognised competence-based frameworks.

04 DUES DUTIES AND STANDARDS: ARCHAEOLOGICAL FIELDWORK TRAINING FROM PASSION TO PROFESSION

Author: Phd Cella, Elisa - Confederazione Italiana Archeologi
Co-Author: Phd Pintucci, Alessandro - Confederazione Italiana Archeologi (Presenting author)
Keywords: Italy, standards, skills
Presentation Preference: Oral

In a country where volunteering is often seen as the main solution to support the protection of public Cultural Heritage, turning archaeological fieldwork from a mere passion into a profession seems to be a long process, far to be concluded. After the birth of professional associations of archaeology about ten years ago, a first milestone can be found in the approval, in 2014, of the first National law recognising Cultural Heritage professionals of in Italian legislation (Law 110/2014). The act was intended to be shortly followed, in no more than six months from its approval, by an implementing regulation referring to dues and duties of archaeologists, an imprescindibile tool to control the nearly deregulated Italian labour market. Despite its relevance, and the lively debate aiming at stating the guidelines to be followed, Italian professionals have just an informal draft of it. The aim of this paper is to analyse the potential value of this act, introducing for the first time standards in terms of education, titles, technicalities, as well as wages and roles, in the Italian archaeological labour market.
In particular, we will focus on the relationship between the skills required and the EQF levels considered, their connections with education, continuing education and training on the job, and the consequences the approval of the implementing regulation would have in the next future.

05 TOWARDS AN INTERNATIONAL SYSTEM OF FIELD SCHOOL ACCREDITATION

Author: Moeller, Katharina - Bangor University (Presenting author)
Co-Author: Karl, Raimund - Bangor University
Keywords: fieldschools, training, accreditation
Presentation Preference: Oral

Field work training is an important aspect of any archaeological degree. A variety of training excavations and other fieldwork training projects are offered by universities and commercial field schools all over the world. However, professional standards for archaeological fieldwork training seem not to have been widely adopted as of yet, despite some professional organisations having published codes of practice or even offering an accreditation system for field schools. The uptake of accreditation is also very slow. As a result there is a wide variability of what kind of training is on offer and neither students nor future employers can assess whether the training received in fieldwork was suitable to prepare the participants of a specific field school for a professional career.
In this paper we will compare and analyse existing codes of practice and accreditation guidelines for fieldwork training like those of the EAA, CIfA and RPA and make suggestions regarding a universal code of practice and an international accreditation system. Such an international system would benefit students, future employers and the archaeological profession as a whole.

328 ALL ABOUT ICIP (THE ICOMOS INTERNATIONAL COMMITTEE ON THE INTERPRETATION AND PRESENTATION OF CULTURAL HERITAGE SITES)

Theme: 6. Interpreting the archaeological record
Author: Hodges, Sue (Australia) - ICOMOS; President, ICIP
Co-Author(s): Kocken, Marc (Netherlands) - ICOMOS NL; MARC heritage consultants
Keywords: Heritage interpretation, archaeology, ICOMOS, ICIP
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The ICOMOS International Committee on the Interpretation and Presentation of Cultural Heritage Sites (ICIP) provides guidelines on best practice in heritage interpretation via the ICOMOS Charter for the Interpretation and Presentation of Cultural Heritage Sites ('Ename Charter'). This roundtable session will begin by introducing ICIP and the Ename Charter and outlining the role and function of heritage interpretation in relation to archaeological work. It will then discuss how key principles in the 'Ename Charter', such as 'Access and understanding', 'Preservation of authenticity', 'Attention to setting and context' and 'Concern for inclusiveness' can be used to inform work on archaeological sites. The session will conclude by using case studies to highlight 'best practice' approaches to heritage interpretation in the management and planning of archaeological work, particularly in cases of post-distaster reconstruction. The roundtable session will be active and participatory, with the facilitators encouraging debate. Results of the session will be used to structure activities within ICIP, including a working group on archaeological interpretation.

The session will also provide an overview of ICIP's workshops, programs and activities for 2017-2018.

330 USING LIVE INTERPRETATION, LIVING HISTORY / RE-ENACTMENT AND MUSEUM THEATRE TO INTERPRET ARCHAEOLOGICAL HERITAGE.

Theme: 6. Interpreting the archaeological record
Author:
Co-Author(s): Van Hasselt, Marc (Netherlands) - Novitas Heritage; IMTAL Europe; Interpret EuropeDimitrovska, Vasilka (Macedonia) - HAEMUS
Keywords: Live interpretation, Re-enactment, Authenticity, Inclusiveness
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Heritage Sites use a number of tools to interpret their stories for the public. Live interpretation, also called costumed interpretation, uses live actors who portray the role of a historical persona. These characters tell the story more effectively than a static display, but also present a number of challenges.

Within the international community, the terminology surrounding heritage interpretation is under debate. Terms such as 'inclusiveness' and 'authenticity' are being questioned and their use is being challenged. UNESCO believes that tourism is changing and heritage sites, including archaeological sites, should be ready to provide the 'authentic experiences' tourists now pursue. But what is 'authentic' and how can this be quantified? Do people visiting European sites receive a European, inclusive story? Or does inclusiveness automatically include exclusion as well?

During this session, we would like to give best practice examples of live interpretation and living history being used to great effect. We would then like to use these examples to have an open discussion on the use of such techniques and how they relate to both inclusiveness and authenticity.

01 THE ROLE OF LIVE INTERPRETATION IN THE COMPREHENSION OF GOBUSTAN ROCK CARVINGS

Author: Ms Yusifova, Shebnem - Gobustan National Historical Artistic preserve
Co-Author: Dr Nuriyev, Rufat - Gobustan National Historical Artistic preserve; Yusifova, Shebnem - Gobustan National Historical Artistic preserve (Presenting author)
Keywords: Gobustan, petroglyphs, museum
Presentation Preference: Oral

One of the most important ways of delivering the essence of rock carvings to the people of different ages more clearly is live interpretation. In this way the explaining of petroglyphs and showing the different shades of meaning to people becomes easier. We would like to note that Gobustan preserve museum which was founded in 1966, more than 6000 rock images on 5 mountains were discovered. Animals that lived here in ancient times, hunting ceremonies, fishing, group dance, transport vehicles, boat and cart drawings, sacrifice ceremonies, rituals had been depicted in these carvings. The most important part of rock carvings are hunters, clan or tribal leaders and women images. By means of drawings engraved on the rocks and stones in various forms, we can get information about the life of ancient people and their occupation. The drawings which are supposed to be the shaman occupy a special place in human images. Live interpretation method gives an opportunity to the tourists and schoolchildren visiting the museum for learning prehistoric man's lifestyle visually. So, different theatrical games - "Prehistoric man's one-day lifestyle" and "Shaman rituals" are organized by the museum. These interactive games are managed by museum guides dressed special clothes. The tourists who come to museum carve images on special stones like prehistoric painters, by means of arrow and bow made of tree branches hit the mark, eat food cooked on the bonfire, are engaged in handmade pottery, participate in coin procedures in mint, perform various rituals with the spiritual leader of the tribe-shamans, dance "Yally" like the dancing men images on the rocks. This method helps us to understand the ancient periods of history, ancient life and tourists feel like prehistoric man living in ancient times themselves.

02 SCUPINI ROMANI - A CHANCE TO LIVE LIKE A ROMAN CITIZEN FROM AN ANCIENT SKOPJE

Author: Archaeologist Dimitrovska, Vasilka - HAEMUS - Center for scientific research and promotion of culture (Presenting author)
Keywords: archaeology, reenactment, Romans
Presentation Preference: Oral

In an attempt to capture the reconstruction of people's everyday life in ancient Rome, SCUPINI ROMANI - a brand dedicated to ancient Roman culture was created. The organizers tried to visualize part of beliefs, traditions, fashion, food and crafts throughout many authentic workshops. Plenty of portable exhibits (pottery, clothing, jewelry, knitted items, souvenirs) inspired by the rich cultural heritage from the Roman period, were specially designed for this purpose and handmade by artists, artisans and craftsmen. The concept of SCUPINI ROMANI is variable depending on the circumstances and can be organized as an ambient setting, mobile exhibition or festival with live actors.

To promote the brand in front of the public, on 06.11.2016 in Skopje was organized an international festival of ancient Roman culture with "HAEMUS" (Macedonia) as a host and "Archaeological Park Viminacium" (Serbia) as a guests and active partner. During the festival and later for the similar following events, a lot of participants including the organizers dressed in authentic costumes and jewelry was used.

Anyhow, the translation of SCUPINI ROMANI means - the citizens of an ancient city of SCUPI, known as Colonia Flavia Scupinorum in the antiquity. This costumed interpretation which uses live persons who portray the role within a historical period, beside promotional, had a very educational dimension for the visitors and the present media, since this is the first historical reenactment ever preformed in the Republic of Macedonia. It also represents a new kind of cultural tourism offer due to the rich archaeological heritage from this period discovered in the country which is open and accessible for public. The main aim of this presentation is to share all the challenges, experience and practices while reconstructing the past using live interpretation to interpret an archaeological heritage from the Ancient Roman period.

03 MUSEUM ESCAPE - REACHING MORE PEOPLE BY LOCKING THEM UP

Author: Museum Escape - reaching more people by locking them up van Hasselt, Marc - Novitas Heritage; Interpret Europe (Presenting author)
Keywords: escape, transmedia, interpretation
Presentation Preference: Oral

In 2016, Novitas Heritage started development of Museum Escape - a pop-up escape room with an archaeological theme. Escape rooms are a popular activity, especially among 18 to 35 year olds. This target audience is traditionally hard to reach for institutions attempting to interest the public in archaeology and heritage. By using the medium of escape rooms, the subject can be presented in a new, challenging and playful way.

As is the case with many heritage sites and institutions, visitors are looking for an authentic experience. By creating a narrative and placing the archaeological record in a narrative, visitors are invited to transport themselves to the distant past and gain understanding of our ancestors. In designing Museum Escape, Novitas Heritage attempted to do the opposite, by bringing archaeological finds to the present. We will discuss the merits and pitfalls of projects such as these.

Museum Escape was developed by Novitas Heritage, in cooperation with Echo-ID, Niels ten Hagen and IntoTheMirror, with support from the provincie Zuid-Holland and the National Museum of Antiquities in Leiden.

04 WISHES, VISIONS, AND PRACTICALITIES: CREATING A BALANCE IN LIVING HISTORY INTERPRETATION

Author: Hartford, Samantha - AmeriCorps (Presenting author)
Keywords: Living History, Balance
Presentation Preference: Oral

Bringing the past to life is a visionary goal, and yet at its core, a practically impossible one as well. In our efforts to provide quality education and meet perceived visitor expectations, we struggle with the realities of limited time, material, information, money -- especially at small living history sites. Compromises have to be made: but how can we ensure we are making the choices that best serve both our history and our visitors? By surveying reenactors, museum staff, and members of the public, this investigation offers insight into creating interpretation that is meaningful when given limited resources.

05 MAKING THE ARCHAEOLOGICAL COSTUMES - RECONSTRUCTION AND INSPIRATION BY AN ANCIENT HERITAGE

Author: Ethnologist Tanevska, Magdalena - Magda (Presenting author)
Keywords: Roman, Skopje, Scupi
Presentation Preference: Oral

I was working on the project Scupini Romani. This project is about the people who lived in the ancient roman city of Scupi (today near Skopje, the capital city of R.Macedonia). I was doing research for more than two months before I started making these costumes. I used wool and linen materials and decorative strips with geometric shapes inspired by that period.

06 INCLUSIVE HISTORICAL RE-ENACTMENT: MAKING VISIBLE THE PAST SOCIETIES DIVERSITY THROUGH THE THEATRICAL IN HERITAGE SITES

Author: Ms Pérez, Clara Isabel - Museu Comarcal Horta Sud (Presenting author)
Co-Author: Soler Mayor, Begonya - Museu Prehistoria Valencia; Dra Jardón, Paula - Universidad de Valencia
Keywords: Live interpretation Inclusiveness
Presentation Preference: Oral

Costume interpretation and the historical reconstruction of the heritage sites must represent the life in the past with the highest degree of rigor. However, they often reproduce important biases. The attraction of certain well-known historical characters (almost always masculine) and exceptional historical events, or the fact of reading the past with 'present eyes', leaves women, children, disabled or different people aside in heritage spaces.Taking into account the results provided by a historical-archaeological research, we stand for the need of incorporating inclusiveness when dealing with the reconstruction of the past. In doing so, visitors can obtain images that are more in accordance with the social and cultural diversity of past societies. Through the analysis of several cases of reenactment activities in heritage sites, we will emphasize both the problems and the questions that arise when turning archaeological knowledge into dramatic representations.

07 "VACATION IN THE PAST" - EFFECTIVE HERITAGE INTERPRETATION

Author: Vasszi, Réka - Csiki Pihenőkert (Presenting author)
Keywords: live interpretaion, gamification
Presentation Preference: Oral

Heritage sites are at a greater risk of passing out of mind regarding the changing needs and wants of today's tourists. Nowadays, visitors inquire for unique experiences, vainly an archaeological park and its monuments can be found just in one exclusive place, still tourist often consider these ruins are similar and tedious.

However, the problem is not with the ruins itself, but how these monuments are interpreted to the audience.
Regularly, heritage visitors are not able to imagine how ancient life was or how the buildings looked like. In other words, they might consider heritage sites as museums with archaeological funds displayed behind from the glass, and not as real, breathing memories from the past. In fact, these visits supposed to be a journey back into the past and

park managers should facilitate this journey with the most effective manner to help tourists immerse in this 'past experience'. Therefore, designing quality and memorable visitor experience is inevitable in order to be profitable in tourism, and at the same time create awareness, due to the fact that the industry transformed into an "Experience Economy".

What is "Experience Economy"? How could heritage sites design memorable experiences? How can Gamification be implemented?
How does LARP works as an educational tool?

Accordingly, the paper presents the answers for these up-to-date questions by exploring the memorable visitor experience design and its importance for planning interpretative activities in museums and heritage sites. In addition, it presents various interpretation tools and case studies how these could be applied in cultural heritage sites, including: Live and ICT-based Interpretation, LARP and Gamification. On the top of that, the results of a recent research are presented which measured which interpretation tool (Live Interpretation, Paper-based Interpretation, ICT-based Interpretation) is the most effective in terms of memorable experience and long-lasting learning.

08 THE ROLE OF LIVE INTERPRETATION IN THE COMPREHENSION OF GOBUSTAN ROCK CARVINGS

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Co-Author: Ms Yusifova, Shebnem - Gobustan National Historical Artistic preserve (Presenting author)
Keywords: Gobustan, petroglyphs, museum
Presentation Preference: Oral

One of the most important ways of delivering the essence of rock carvings to the people of different ages more clearly is live interpretation. In this way the explaining of petroglyphs and showing the different shades of meaning to people becomes easier. We would like to note that Gobustan preserve museum which was founded in 1966, more than 6000 rock images on 5 mountains were discovered. Animals that lived here in ancient times, hunting ceremonies, fishing, group dance, transport vehicles, boat and cart drawings, sacrifice ceremonies, rituals had been depicted in these carvings. The most important part of rock carvings are hunters, clan or tribal leaders and women images. By means of drawings engraved on the rocks and stones in various forms, we can get information about the life of ancient people and their occupation. The drawings which are supposed to be the shaman occupy a special place in human images. Live interpretation method gives an opportunity to the tourists and schoolchildren visiting the museum for learning prehistoric man's lifestyle visually. So, different theatrical games - "Prehistoric man's one-day lifestyle" and "Shaman rituals" are organized by the museum. These interactive games are managed by museum guides dressed special clothes. The tourists who come to museum carve images on special stones like prehistoric painters, by means of arrow and bow made of tree branches hit the mark, eat food cooked on the bonfire, are engaged in handmade pottery, participate in coin procedures in mint, perform various rituals with the spiritual leader of the tribe-shamans, dance "Yally" like the dancing men images on the rocks. This method helps us to understand the ancient periods of history, ancient life and tourists feel like prehistoric man living in ancient times themselves.

331 SILENT TRACES OF THE PAST – INTERPRETING RESULTS FROM ARCHAEOLOGICAL PROSPECTION

Theme: 6. Interpreting the archaeological record
Author: Rensink, Eelco (Netherlands) - Cultural Heritage Agency of the Netherlands
Co-Author(s): Keller, Christoph (Germany) - LVR-Amt fur Bodendenkmalpflege im Rheinland
Keywords: prospection, case studies, methods, interpretation
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Prospection is an important link in the chain of processes involved in the management of the archaeological heritage. The aim is to obtain an insight at an early stage of the planning process into the presence or absence of archaeological find spots. If find spots are indeed present, one must then consider the value of what has been found. The main factors one must consider when assessing the value of a find spot are its nature, size, date and quality (both scientific and physical).

Despite the fact that a great deal of experience has been gained with archaeological prospection over the past few decades, interpreting results from archaeological prospection is by no means easy or obvious. This session aims to bring specialists from different countries together to discuss new insights and developments in archaeological prospection. The main goal is to hear about case studies which provide good examples of problems, opportunities and learned lessons when it comes to the interpretation of results of prospection. What can we learn from these case studies in terms of the effectiveness and reliability of different prospection methods?And is it advisable to use just one method or do we always need a set of different prospection methods to gain reliable results?
By answering these (and other) questions, the session will contribute to new insights relevant to useful prospection surveys in the future.

01 SILENT TRACES OF THE PAST. A SHORT INTRODUCTION FROM A DUTCH PERSPECTIVE.

Author: Dr RENSINK, Eelco - Cultural Heritage Agency of the Netherlands (Presenting author)
Keywords: prospection methods Netherlands
Presentation Preference: Oral

In recent years, several publications in the Netherlands have focused on the characteristics of different types of find spots and their implications for the efficient use of prospection methods. The Dutch Archaeology Quality Standard also mentions several of these characteristics in its desk-based assessment protocol, and as part of the specified archaeological prediction. Based on this prediction, archaeological field evaluations are carried out to obtain an insight at an early stage of the planning process into the presence or absence of archaeological find spots. If find spots are indeed present, one must then consider the value of what has been found.
For years, Dutch archaeologists have been debating the right way to detect archaeological find spots (sites) in the varied landscape. The Cultural Heritage Agency of the Netherlands has been working for a number of years on accurate methods of archaeological prospection. Since October 2016 the results of this work are available online (www.archeologieinnederland.nl), incorporating a digital information system which can help – on the basis of specific characteristics of archaeological sites - to determine the best method of prospection.
In this introduction methods of prospection archaeology in the Netherlands are addressed using examples of daily archaeological practice. In addition, the principles and workability of the digital information system are briefly discussed.

02 IN SEARCH OF NEANDERTHALS BY CORING. A GEOARCHAEOLOGICAL SURVEY OF THE BURIED DUTCH LOESSLANDSCAPE ALONG THE BPL

Author: Drs. Paulussen, Rob - ArcheoPro (Presenting author)
Co-Author: Drs. Raczynski-Henk, Yannick - ADC; university of Leiden
Keywords: Paleolithic, loesslandscape, corings
Presentation Preference: Oral

The BPL is a planned highway route in the eastern part of Southern Limburg, the Netherlands, with a total length of 26 kilometers. It crosses a dissected landscape with river terraces of the Maas covered with loess. In 2009 started a geoarchaeological survey of this planned route The main goal was to locate parts of this route where archaeological sites within this landscape could be preserved and a follow-up prospection and eventually an excavation would be necessary. Until the end of 2013 this survey concentrated on the upper part of the loessoil with the typical Holocene luvisol or the Holocene colluvium.
In 2014 started a deep soil survey with the main aim to prospect buried Middle Paleolithic/MSA sites in an early stage of the building process. The first step in this deep soil survey was the use of high quality corings to reconstruct the Pleistocene paleolandscape beneath the Holocene topsoil or the Holocene colluvium. Main goal was finding sediment traps with well preserved pré Holocene interglacial and interstadial soils within a high resolution sediment sequence. Based on experiences in Belgian loess quarries, the expectation was finding Neanderthal campsites in these sediment traps. But would it be possible with the use of corings to pinpoint these high expectation sites, as a first step in the deep soil survey and to constrict the area where high costs archaeological surveys by digging deep test trenches and to avoid a last minute follow up of the high speed constructors excavators?

03 SETTLEMENT LAYOUT DEVELOPMENT IN THE CHALCOLITHIC CUCUTENI CULTURE OF NORTHEASTERN ROMANIA. INTERPRETATION AND PRESENTATION OF PROSPECTION RESULTS

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Keywords: geophysics, LiDAR, Cucuteni
Presentation Preference: Oral

The Cucuteni culture, regarded as the last great Eneolithic civilisation of Old Europe, has been investigated since the 19th century.
There are more than 1800 sites on Romanian territory, whether hilltop or lowland settlements, compact or scattered, seasonal or permanent, main or secondary, small, medium or large in size, clearly showing the extremely dynamic character of these communities.
Although there is a long history of research concerning this culture and numerous trial excavations have been made in many settlements that chronologically span three great phases (A, A–B, B), in only a handful of sites has archaeological research generated a completed planimetric image (viz. Hăbășești, Târpești, Trușești). In addition, investigations very rarely were extended outside the natural limits of the settlements, or to the outer complex systems considered to be fortification or delineation works. It is difficult to propose hypotheses concerning the cultural landscape of the Eneolithic period based solely on the minimal information gathered almost exclusively from archaeological excavations. Accordingly, even though there have been discussions regarding these topics, in certain environmental conditions, a great number of aspects essential for understanding the behaviour of the Cucutenian communities are far from known.
Considering the above, the generalisation for the Cucuteni culture of non-invasive investigations based on integrating the main prospecting methods (Airborne Laser Scanning, aerial photography and geophysical surveying) represents a practical approach for interpreting many of the aspects mentioned above. It also provides new opportunities for understanding the complex evolution of the Cucutenian and other prehistoric settlements. Such a methodology, based on the integration of the main non-invasive prospecting methods, is still weakly represented in Romanian archaeology, even though it has justifiably become a cornerstone of archaeological research worldwide.

04 SEEING BEYOND THE SURFACE

Author: Dr. Ciuperca, Bogdan - PRAHOVA DISTRICT MUSEUM OF HISTORYAND ARCHAEOLOGY
Co-Author: Dr. Măgureanu, Andrei - "Vasile Pârvan" Institute of Archaeology of the Romanian Academy in Bucharest (Presenting author); Mr. Anton, Alin - PRAHOVA DISTRICT MUSEUM OF HISTORYAND ARCHAEOLOGY
Keywords: Lower Danube, roman
Presentation Preference: Poster

Archaeology is about what we see and about what we can not see and the geophysical prospection can play the role of a "third" eye of archaeologist.
In the Lower Danube region, in the specific area of the village Târgşoru Vechi, a lot of roman artefacts were discovered cross time, starting from 1956 till now. Stamped bricks of Legio IX Claudia pia fidelis, pottery and other findings were testimony for a roman fort in the area, but at the surface of the terrain nothing can be seen. The archaeological intrusive explorations, having as goal the medieval ruins or 4th century Cerneachov cemetery, succeeded to identify the roman bath only, the fort, its position, size and structures reaming a mystery.
Recent we appeal to aerial photography, to electric resistivity and magnetometer investigation to make a step forward. This approach and its results are the subject of our presentation.

05 LANDSCAPE CONTEXT OF ROMAN SITES – A TRANSITION REGION ON THE NORTH WESTERN FRINGES OF THE LOWER RHINELAND

Author: Cott, Eva - LVR-Amt für Bodendenkmalpflege im Rheinland (Presenting author)
Keywords: (non)-villae-landscapes, transitionzone, landscape-analysis
Presentation Preference: Oral

The survey-project is looking into the cultural and regional aspects of transition between villae and non-villae landscapes in the north-western part of the Lower Rhineland. Starting of at the well researched Loess region the project is looking into the development of the roman landscape and settlement development in an area, being far more

peripheral economically and geographically as well as by means of archaeological research. Research includes not only surveys but also deskbased analysis of site distribution and landscape morphology.
Most field walking is done on areas designated for the extraction of gravel and other non energetic mineral resources. The Erkelenz area is connecting the rhenish and south limburg-belgium loess regions and can be considered as a classical villae landscape, while the more northern parts of the project area are linked to the Maas region and northern Lower Rhineland.
The roman villae landscape of the loess regions is well known due to long history of research within the rhenish open cast-mining areas. Far less research has been done in the northern sand areas making it necessary to include information gathered in the Maas-Demer-Scheldt area and the hinterland of the Lower Rhine limes.
Archive research has provided information on 262 different sites, which can be divided into five separate site categories. Landscape analysis includes pedological aspects as well as information on land use during the early 19th up to 20th century. Based on the distribution of different soils and agrarian use four sub regions can be distinguished, to analyze the site distribution even further.
Future fieldwork and research will focus on the different roman settlement regions and their cultural and economic characteristics. A well defined transition zone will be of special interest. Furthermore the development of different processes, establishing areas of extensive and intensive agrarian regimes, during time will be investigated.

06 SILENCE IN THE BACKGROUND NOISE? DETECTING MEDIEVAL FARMSTEADS BY ARTEFACT-ACCURATE FIELDWALKING

Author: M.A. Keller, Christoph - LVR - Amt für Bodendenkmalpflege im Rheinland (Presenting author)
Keywords: fieldwalking, medieval settlement
Presentation Preference: Oral

During the past 25 years field walking surveys in the western part of North Rhine-Westphalia (D), many being artefact-accurate surveys, have helped to discover and de-fine settlements from the Neolithic right up to the 19th century. Some, like roman villa sites, are easily located by the sheer number of surface finds, while others, like Iron Age farms, can be identified by just a handful of pottery shards and flint objects.
The Lower Rhine area is a region where medieval settlement patterns include not only large villages but also a fair number of isolated farms, often occupied only for generation or two and now long deserted.
Many of these deserted medieval settlements are difficult to locate in field walking sur-veys due to the system of medieval waste disposal. Most often broken pottery was not discarded by burying in pits and other features within the settlement but was collected with other household rubbish on the farm's dung heap and later used for manuring gardens and fields.
The talk will look into the different aspects of ceramic manure scatters and the difficulties to locate and identify medieval farmsteads and hamlets within this „background noise". Probably the absence of surface finds within a dense manure scatter can be one indicator in the process of locating deserted medieval farmsteads.
The talk will also have a look on how and when small medieval sites have been discovered during 25 years of polluter pays principle funded archaeology in the Rhineland and provide strategies for future detection and protection.

07 PALYNOLOGY AS PROSPECTING IN ARCHAEOLOGY

Author: Dr Ledger, Paul - University of Aberdeen (Presenting author)
Keywords: Palynology, chronology, prospecting
Presentation Preference: Oral

Palynology, in particular pollen analysis, is a form of environmental analysis with a long history of contributing to the understanding of how humans have shaped and interacted with the natural world. Indeed, a majority of archaeologists are likely familiar with the saw-toothed diagrams arising from the meticulous analysis and counting of innumerable pollen grains – not to mention other microfossils and charcoal particles. At a fundamental level, the merits of these stratified sequences of relative changes in plant taxa through time are readily appreciated by archaeologists. The ability to reconstruct the vegetation history of an archaeological site provides a backdrop onto which changes in material culture, site evolution or demographics can be mapped. Indeed, it is this context, as a subsidiary element of post-excavation analyses, that palynology is frequently called upon in archaeology. What is perhaps less well exposed and appreciated is the potential of pollen analysis as a non-intrusive prospective tool. Calls for more creative applications of pollen analysis in archaeology are far from novel, although the focus has often been on predicting the occurrence, rather than the prospecting, of sites. A first step to understanding an archaeological site is establishing a chronology. In almost all instances this requires excavation to recover either material or organic remains that can be used to estimate a date. However, where suitable deposits are present, high resolution pollen analysis and radiocarbon dating coupled with chronological modelling can be used to achieve this in a non-destructive manner. By way of a series of case studies this paper aims to illustrate how the palynological analysis of sedimentary archives can be an important part of archaeological prospecting.

333 CROSS-DISCIPLINARY APPROACHES TO PREHISTORIC DEMOGRAPHY

Theme: 6. Interpreting the archaeological record
Author: Silva, Fabio (Spain) - IPHES - Institut Català de Paleoecologia Humana i Evolució Social
Co-Author(s): Fernández-López de Pablo, Javier (Spain) - IPHES - Institut Català de Paleoecologia Humana i Evolució SocialVander Linden, Marc (United Kingdom) - UCL Institute of Archaeology
Keywords: Prehistory, demography, radiocarbon, paleoanthropology, DNA
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The study of demography has been of long interest to prehistorians, who have been concerned with whether there were any demographic transitions associated with climatic events, the introduction of new technologies and subsistence strategies or, more generally, with cultural change. However, no element of the archaeological record is directly associated with demographic factors such as population sizes, growth or fertility rates – they therefore must be inferred.Some of the most commonly cited approaches involve the statistical analysis of different archaeological proxies, namely number of sites, artefact densities, radiocarbon dates, palaeoanthropological data such as cemetery age profiles, and DNA. However, demographic factors derived from these approaches can be significantly different, even when they pertain to the same region and period. Such differences might be due to variations in the scale of analysis or may be indicative of issues with the derivation or comparison of factors inferred from different proxies.This session aims to bring together scholars who have been considering prehistoric demography using differing, but complementary, datasets and approaches, with a view towards discussing issues raised by multi-proxy analysis and cross-disciplinarity. Examples of questions to be discussed include the equifinality in proxy interpretation, the choice of demographic growth models (e.g. exponential, logistic or irruptive growth), as well as the identification of significant demographic events, such as booms, busts, bottlenecks and migrations.We

therefore welcome papers that address these issues either from a purely theoretical perspective or via case studies.

01 THE LATE GLACIAL AND EARLY HOLOCENE IBERIAN RADIOCARBON RECORD: DATA QUALITY CONTROL AND FILTERING CRITERIA FOR PALEODEMOGRAPHIC STUDIES

Author: Gómez-Puche, Magdalena - Institut Català de Paleoecologia Humana i Evolució Social (IPHES), Tarragona, Spain (Presenting author)
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Keywords: radiocarbon, metadata, auditing
Presentation Preference: Oral

The reconstruction of demographic dynamics using a "dates as data approach" often confronts problems of accuracy and reliability due to different factors: the incomplete publication of the metadata associated to each radiocarbon date, the inbuilt age of the sample, the stratigraphic association with the archaeological context, the carbon source and the calibration process. Considering the accumulative nature of the radiocarbon record, the implementation of protocols of data quality control and filtering criteria requires an explicit definition.
In this paper we introduce a new database of 1998 radiocarbon dates from 651 assemblages and 246 archaeological sites collected over the past two years in the context of the MULTI-SCALARDEM(1) and the PALEODEM(2) research projects, spanning from the Early Magdalenian to the Late Mesolithic in the Iberian Peninsula. We will focus on the exploratory data analysis of the standard deviation error and the quantitative and qualitative criteria used to filtering dates. Finally, we discuss the protocol used for ranking the quality and accuracy of radiocarbon dates in our dataset for building a more robust database for statistical analyses.
(1) HAR2015-70685-ERC. "Europa Excelencia" Projects 2015. MINECO (Spain).
(2) ERC CoG 2015, Ref.683018. European Commission-Research.

02 WAS POPULATION DENSITY A CONSTRAINING FACTOR FOR REGIONAL SCALE TECHNOLOGICAL DIFFERENTIATION DURING THE PALEOLITHIC? EVALUATING A HEURISTIC MODEL

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Keywords: Demography, technology, regionalization
Presentation Preference: Oral

Increasing data on Paleolithic stone tool technology in southwest Asia raise the issues of recognizing inter-regional cultural differentiation and the potential identification of local trajectories of change. However, a commonly held view of Paleolithic hominin populations is that they were too sparsely distributed to engender regionally cohesive material culture. In this presentation, we address the question of whether regional cultural differentiation could have been sustained demographically during the Paleolithic. We compiled ethnographically-derived estimates of territorial ranges and population sizes of selected hunter-gatherer groups that are fully nomadic, utilize no domesticates, and occupy a range of environments. Based on these estimates we evaluate Whallon's (2006) heuristic model of hunter-gatherer spatial organization and territory size. Whallon's model most likely overestimates the sizes of populations and expected occupational territories. We then projected the model onto southwest Asia to consider implications for Paleolithic hunter-gatherers.
Our results suggest that population density alone was most probably not a constraining factor for the establishment of regional cultural patterning during the Paleolithic. In order to transfer this visualization from a general approximation to a more realistic model bounded in time and space, one needs to take into account external pressures. These include environmental fluctuations, topographic and biogeographic barriers and their effect on carrying capacity, and hominin population dynamics including isolation, local extinctions, and dispersals. Thus, most probably, population structure and dynamics were more significant factors that led to the emergence of regional cultural trajectories. Much still needs to be learned to utilize cultural proxies like stone tool assemblages to gain insight into Paleolithic hominin demography and population dynamics. An alternative explanatory framework for societal mechanisms that create, maintain, and enhance regional cultural differentiation should be developed. Such a framework is needed to bridge the profound gap in temporal and spatial scales between the ethnographic and prehistoric records.

03 TRACING THE LONG-TERM DEMOGRAPHIC CHANGES: THE ISSUE OF SPATIAL SCALES

Author: Dr Diachenko, Aleksandr - Institute of Archaeology of the NAS of Ukraine (Presenting author)
Co-Author: Professor Dr Müller, Johannes - Institut fuer Ur- und Fruehgeschichte, CAU, Kiel
Keywords: population density, estimations
Presentation Preference: Oral

What is the proportion of small region, inhabited by high number of people, or the large area with dispersed population in the average population density at macro-region? If certain innovation impacts the increase in population density at certain region, then how this innovation influences population density at the scales of macro-regions and density of meta-population? These and other questions of economic demography may be answered with weighting the values of population density in order to transform the initial data, representing the regional case studies, into the values that may be compared with each other at the spatial scales of high orders.
This paper deals with the analysis of long-term changes in population densities at the regional scale, macro-regional scale and density of meta-populations. The following issues of estimations are addressed: chronological resolution of demographic changes; estimation of the weight of values for population density in order to transform the initial values included into the sample into the values that may be compared with each other at the regional scale; calibration of the transformed values into real population densities; and estimation of the weight of values for population density at the scales of macro-regions and density of meta-populations. The proposed methods are tested on demographic changes in Central Europe and Southern Scandinavia, Southeastern Europe, and Near East.

04 THE NEW WAVE! OR WHY THERE IS STILL A POINT TO SPEAK OF "DEMIC WAVE"

Author: Dr Vander Linden, Marc - University College London (Presenting author)
Keywords: Early Neolithic
Presentation Preference: Oral

The possible existence of a demic wave, first discussed by Ammerman and Cavalli-Sforza, accounting for the spread of early farming across Europe has proven one of the most successful and divisive concept in the field of Later European Prehistory. Whilst proving very powerful for modelling purposes for instance, it has been recurrently criticised by many archaeologists as too simple, and thus at odd with the intrisincally complex nature of the archaeological record.
Recent aDNA research, albeit coming with problems of its own, has however provided an empirical and independent justification for the existence of a demographic signature, if not a wave, associated with the introduction of plant and animal domesticates across several parts of Europe. In this sense, a re-assessment of the concept of demic wave is needed, especially in order to quantitfy its changing spatial and temporal signature and its potential impact upon the archaeological record of the Early Neolithic. This paper will review these questions in the light of recent work, largely undertaken as part of the ERC-funded project EUROFARM.

05 ASSESSING HIGH QUALITY APPROACHES REGARDING SPD AND EWS METHODS TO EXPLORE DEMOGRAPHIC PATTERNS IN THE SPREAD OF AGRICULTURE IN IBERIA

Author: Dr. García-Puchol, Oreto - Universitat de València (Presenting author)
Co-Author: Dr. Diez Castillo, Agustín - Universitat de València; Dr. Pardo-Gordó, Salvador - Universitat de València; Dr. Bernabeu Aubán, Joan - Universitat de València
Keywords: SPD, EWS, Neolithic
Presentation Preference: Oral

Demographic patterns constitute a major subject of interest to analyze socioecological dynamics in prehistory. Recently the use of summed of calibrated radiocarbon dates as a relative demographic proxy is being increasingly used to look at prehistoric population patterns. Considering some criticism regarding questions that affect several archaeological, radiometric and taphonomic aspects, recent literature shows the application of different filters and protocols to test the results according with a refined methodology. In this presentation we introduce a comparative approach to assessing SPDs including filters to multi-dated sites (combined dates by site, combined dates by phases from archaeological information, calibrated density dates/site by time), regarding taphonomic bias and simulation processes from a null model distribution and trying to identify the recently proposed (in other parts of Europe) Neolithic Early Warning Signal (EWS). Our proposal is aimed to enhance the discussion about the results in order to fit key questions relating to the transition to farming and herding practices in Iberia. We consider a wide chronological span from the current radiocarbon database of Iberia (9000 to 5000 cal BP), that allow us to investigate socioecological dynamics in the recent prehistory of Iberia in both, general and regional scales, and considering a longue duree view.

06 ANCIENT DNA AND THE COLONIZATION OF SCANDINAVIA

Author: PhD Malmström, Helena - Uppsala University (Presenting author)
Keywords: aDNA, Mesolithic, Scandinavia
Presentation Preference: Oral

Scandinavia was one of the last geographic areas in Europe to become habitable for humans after the latest glaciation. Consistent signs of human habitation appear in the archaeological record around 11,000 BP. Several migration routes have been proposed based on archaeology, climate modelling and genetics, including from the south, from the southeast, from the northeast or combinations of these. I will review what newly generated genomes, and previously published genomes, from Mesolithic individuals from Scandinavia can tell us about the population history of the early Scandinavian colonizers. More specifically, I will discuss where the colonizers came from, what routes they followed and how they related to each other as well as to other Mesolithic groups.

07 THE MATERIAL DEMOGRAPHY OF PASTORALISTS: ASSESSING POPULATION HISTORY, MATERIALS, AND LANDSCAPE IN THE BRONZE AGE OF THE SOUTHERN URALS

Author: Dr. Johnson, James - University of Copenhagen (Presenting author)
Keywords: Pastoralists, Population History
Presentation Preference: Oral

Archaeological studies of prehistoric pastoral societies have focused primarily on emergent socio-economic relationships between humans, herd animals, and their local environments. Such studies have centered much of their explanatory power on modeling human-environment dynamics, including diet and mobility often utilizing isotopic analyses, GIS, and now XRF and other trace elemental identification technologies. Even as these studies have taken center stage in recent studies of these societies, there is an assumption that has yet to be thoroughly challenged: that because pastoral societies are limited demographically in terms of growth and sustainability, their numbers must be relatively low. Even more so, there is the notion that once 'settled' pastoralists become more mobile and their populations become increasingly dispersed their numbers by community and settlement will by necessity decrease. This paper shifts focus on pastoral societies from humans and animals taking center stage to a more critical exploration of the intersection between population history, material demography, and the socio-political dynamics that accompanied population dispersal among Late and Final Bronze Age pastoral societies of the southern Urals region, 1700 - 900 BCE. Through a combined approach of ceramic paste analysis and landscape-modeling using GIS, I investigate whether or not populations increased or decreased, and the role and mobility of historical capital in the form of ceramic pastes and landscape use that accompanied demographic dispersals first recorded for the end of the Middle Bronze Age, ca. 1800/1700 BCE, and then again around 1300 BCE.

08 EXPLORING THE DEMOGRAPHIC ASPECTS OF THE MESOLITHIC - NEOLITHIC TRANSITION IN CENTRAL BALKANS VIA TOOTH CEMENTUM ANALYSIS: PRELIMINARY RESULTS

Author: Penezić, Kristina - BioSense Institute,University of Novi Sad, Serbia (Presenting author)
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Keywords: Mesolithic-Neolithic transition, Paleodemography
Presentation Preference: Oral

The Neolithic way of life was accompanied with an increase in fertility and increase in other forms of physiological stress (e.g. disease, malnutrition). Evidence of this stress could be seen in tooth cementum. The formation of each incremental line in tooth cementum corresponds to one year of life and is related to calcium metabolism. Lines corresponding to physiological stress events are different in appearance and are referred to as "crisis lines". Given the changes related to the Mesolithic-Neolithic transition, we would expect to find a difference in the frequency of physiological stress events between the Mesolithic and Neolithic populations due to increased fertility and/or increased presence of pathology and disease. In this paper we present a method for determining and quantifying stressful events and for statistical comparison of the stress event frequency between populations. The method is applied to a sample of Mesolithic (9000 - 6400 calBC) and Neolithic (6200 - 5300 calBC) teeth from the Central Balkans.

09 C14-DATES AND SHORELINE DATED SITES AS DEMOGRAPHIC PROXIES IN SOUTH-EASTERN NORWAY, C. 9500-2500 CAL. BC: PROBLEMS AND POTENTIALS.

Author: Dr. Solheim, Steinar - Museum of Cultural History University of Oslo (Presenting author)
Keywords: Prehistory, demography, radiocarbon
Presentation Preference: Oral

Modeling and analysis of radiocarbon dates may suggest temporal fluctuations in population density or human activity. The use of C14-data as population proxy is however not without its limitations. An important critique is that the distribution of C14-dates reflects archaeological activity, not prehistoric activity. Consequently, it is called for comparable proxies such as environmental data and other archaeological data in order to investigate the reliability of the C14-models.

This paper focuses on temporal variation in demography and settlement intensity in the coastal areas of South-eastern Norway during the period c. 9500-2500 cal. BC. The paper aims to discuss demographic variation based on two different data sets: C14-dates and shoreline dated sites. The comparison of the data sets raises important methodological questions regarding studies of prehistoric demography, and issues such as the shortcomings of the C14-data from the region will be addressed (preservation, lack of data, dating strategies etc.).

10 MODELLING MATERIAL DIVERSITY DURING THE DIFFUSION OF EARLY FARMING AND ASSOCIATED TECHNOLOGIES

Author: Dr Drost, Cornelis - University College London (Presenting author)
Keywords: ABM Neolithic Demography
Presentation Preference: Oral

The development of early farming is arguably a fundamental technological revolution. In the European case, both plant and animal domesticates were introduced from an external centre of domestication located in the Near East, so that we are dealing with a process of technological diffusion and adaptation. As evidenced by an impressive quantity of archaeological data, the spread of agriculture and stock-breeding across Europe is a long and uneven spatio-temporal process which lasted over three thousand years and, without much surprise, was paralleled by a variety of archaeological assemblages.
The dispersal process that occurred at the onset of the Neolithic in Europe has a role in shaping the distribution technology and culture throughout the following millennia, which has yet to be fully understood. As part of the ERC-funded project EUROFARM, now nearing completion, we have developed our understanding of that process through theory and the application of an agent based model.
The cultural dissemination model devised by Axelrod (1997) offers and extremely simple analogue to the archaeological assemblages through which we observe the past, and with minor additions we adapt it to the conditions of the early-mid Neolithic, where at first the migrant front, and later adaptation to local environment, may be the driving forces that shape the evidence that we observe.

11 SUPPLY AND DEMAND IN THE NEOLITHIC QUARRY PRODUCTION OF NORTHWEST EUROPE

Author: Prof. Shennan, Stephen - University College London
Co-Author: Dr. Edinborough, Kevan - University College London (Presenting author)
Keywords: Economics, Neolithic, Europe
Presentation Preference: Oral

What factors influenced non-agricultural production in prehistory? Explicitly or implicitly this has long been a topic of debate in prehistoric archaeology, because it relates to the question of whether people in prehistoric societies had 'economic' motivations and what those might have been. The paper will address this issue by presenting the first results of the NEOMINE project https://www.ucl.ac.uk/neomine which is analysing the evidence for stone quarrying and flint mining and the factors affecting consumption of their products by Neolithic early farming communities in Britain and North West Europe over the period c.5300-2000 BC. The project's aim is to evaluate what economic factors, if any, had an influence on their scale and intensity, and in particular the extent to which the amount of material they produced varied over time in response to external demand.
On the basis of newly collected and newly updated radiocarbon data on the dating of Neolithic mines and quarries in the region we will test whether their periods of use correlate with periods of high population and therefore high demand in the area surrounding the mine, using summed radiocarbon probabilities as a population proxy while taking into account sampling variation and fluctuations in the calibration curve. We will go on to explore the factors affecting the distribution of products of known source, focussing on the Implement Petrology Group data for Britain.

334 ASSESSING THE APPLICATION OF THE EU ENVIRONMENTAL IMPACT ASSESSMENT DIRECTIVE ACROSS EUROPE

Theme: 2. The Valletta Convention: the next 25 years
Author: Waugh, Karen (Netherlands) - Vestigia BV, Archeologie & Cultuurhistorie
Co-Author(s): Hey, Gill (United Kingdom) - Oxford Archaeology
Keywords: EIA Directive, legislation, spatial planning
Presentation Preference: Round table

The Environmental Impact Assessment Directive is the only piece of EU legislation which is directly and substantially concerned with the archaeological heritage. The Directive has wide implications for the practice of Archaeology in Europe. The success of its implementation has important repercussions on a national level for the relationship between Archaeology and spatial planning procedures.
Previous sessions in Glasgow and Vilnius, resulting in the establishment of a Working Party, set out to focus on specific issues with potential implications for the archaeological profession that extend well beyond the body of individual development projects that require EIA. Central to the discussion is the extent to which we can achieve a greater harmonisation within the common societal goal of archaeological heritage protection and management, against a background of widely varying local situations, approaches and pressures.
The proposed open discussion session at Maastricht will report on the work of the Working Party to date, with a view to drafting EAA guidelines for the implementation of EIAs. Discussion will continue to concentrate on data gathering across Europe and beyond, and on the need for a broader approach, exploring the strengths and applicability of associated mechanisms, such as Heritage Impact Assessments.
Members are invited to present a short contribution, assessing the range of experience working with EIAs and the degree of legislative compliance within their country. Information relevant to this session and the ongoing work of the Working Party and associated EIA Community can be found on the EAA website and will be regularly updated.

335 THE SILICEOUS RAW MATERIALS OF NORTHWESTERN EUROPE: TRANSNATIONAL DIALOGUE ON THE CHARACTERIZATION OF RAW MATERIALS

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Denis, Solène (France) - CNRS-UMR 7055, Préhistoire et Technologie, Université Paris Ouest
Co-Author(s): Collin, Jean-Philippe (Belgium) - Laboratoire Interuniversitaire d'Anthropologie des TEChniques LIATEC, UNamur; CNRS-UMR 8215 - Trajectoires - De la sédentarisation à l'État , Université Paris 1
Keywords: flints, Northwestern Europe, macroscopy, mesoscopy
Presentation Preference: Workshop

Raw material characterization is a prerequisite of any study on prehistoric lithic industries. In this perspective, many lithothecas were established over the last decades, scattered all over Europe and often heterogeneous composed. On one hand, they are generally under-used by archaeologists. On the other hand, they do not allow to easily identify the exogenous raw materials varieties. Nevertheless, the study of the diffusion of flints over long distances as well as the progress realized these last decades in petro-archaeology and geochemical analysis have really highlighted the need to form a solid reference collection of raw materials.
While it is obvious that the mobility and the networks of prehistoric exchanges transcend the current borders of our countries, there is no cross-border teaching on the identification and recognition of the siliceous raw materials used in Prehistory. We wish to take advantage of the EAA 2017 taking place in a region full of siliceous raw materials, to propose a platform of exchanges on the characterization and identification of flints of the chalk from the North of France to the lower Rhine Valley. This workshop will question the limits of our regional reference collection for the identification of raw materials circulated over long distances.
We aim at establishing a transnational dialogue between researchers on the macro- and mesoscopic characterization of raw materials that could be a springboard for a dynamic and long-lasting networking of the researchers of Northwestern Europe. The presence of junior researchers is strongly encouraged.

01 FLINT RAW MATERIAL AND NEOLITHIC IN THE PARIS BASIN.

Author: Dr Allard, pierre - CNRS (Presenting author)
Keywords: Paris Basin, Flint
Presentation Preference: Oral

The geological Paris Basin is constitued of successive marine deposits from throughout periods from the Triassic to the Pliocene. The varying nature of the clays, limestones and chalk gives rise to the characteristics of the regions but also include a large number of varied flint deposits. Flint sometimes are very numerous and come from Cretaceous (Turonian and Senonian) but also Tertiary layers (Lutetian and Bartonian).
We will present in this paper the main siliceous raw material exploited by the neolithic population, more specially in the eastern part of the Paris Basin. Flint mining sites are known since the late 19th century but several works mainly focus on the identification and the localisation of flint source since the end of eighties enable us to better understand where are located the main outcrops.
The main goal in this paper is to review the present state of knowledge and also present the problems related to flint characterization in this specific region rich in flint and archaeological sites.

02 EXPLOITATION OF HAINAUT (BELGIUM) FLINTS AT THE END OF PREHISTORY: A RAW MATERIAL OVERVIEW

Author: Collin, Jean-Philippe - Université de Namur; Université Paris 1; UMR 8215 (Presenting author)
Co-Author: Collet, Hélène - Service Public de Wallonie; Denis, Solène - UMR 7055; Van Assche, Michel - Recherches et Prospections Archéologiques asbl
Keywords: Flint, macroscopy, characterization
Presentation Preference: Oral

The Mons Basin, in the province of Hainaut (Western Belgium), is one of the main source of flints in the country. The profusion of Mesozoic deposits in this small area at the North-east of the Paris Basin, has led to an important flints gathering activity during Prehistory.
For decades, archaeologists have prospected outcrops (e.g. de Heinzelin, Hubert). Unfortunately the samples are scattered and for the current requirements of research, data registration appears sketchy, descriptions seems uncomplete while the nomenclature is generally irrelevant.
Recently, a renewal of interest for raw materials in the discipline has nevertheless allowed some progress, as illustrated by the creation of the Mons Basin Lithotheque Group and by recent works (Allard et. al 2010; Moreau et al. 2013; Aubry et al. 2014, Denis unpublished, Collin in progress).
This presentation offers the opportunity to give an overview of the main flint raw materials of the Mons Basin in order to propose key identification criteria for use by the archaeologist and allow them to carry out a better sorting of raw material prior to any petrographic or geochemical study.

03 RAW MATERIALS OF HESBAYE EXPLOITED BY NEOLITHIC POPULATIONS: DENOMINATION, OUTCROPS LOCATION AND CHARACTERISTICS

Author: ALLARD, Pierre - CNRS-UMR 7055, Préhistoire et Technologie
Co-Author: DENIS, Solène - CNRS-UMR 7055, Préhistoire et Technologie, Université Paris Ouest (Presenting author); BOSQUET, Dominique - Service Public de Wallonie; COLLIN, Jean-Philippe - Unamur; Université Paris 1; UMR8215; LIATEC
Keywords: Hesbaye, outcrops, macroscopy
Presentation Preference: Oral

In Hesbaye, the Cretaceous layers are located in the lower part of the Meuse Valley (Hesbaye liégeoise). In the Neolithic collections, precisely those from the Early Neolithic, two raw materials can be found: the fine-grained flint of Hesbaye in opposition to the one called grained flint of Hesbaye. According to the observations made in Verlaine, the first one would come from the Campanian, more precisely from the Nouvelles bedrock (Allard, 2005). The second one is grey, clear and very grained and seems to be often removed in secondary position. Sometimes, different varieties of grained flint are distinguished. The Gulpen flint, where outcrops have been found in the south-east of Maastricht, can also be found in the Belgium Limbourg. In Orp-le-Grand, a flint mine attributed to the middle/final Neolithic has delivered a very close raw material (de Grooth, 1991). The author notices the great proximity between the flint of Orp, the Rijckholt and Spiennes ones, even if a recent study showed that it is possible to distinguish the different Upper Cretaceous flint types (de Grooth 2011). So, according to the different authors, different denominations have been used for the same flint, phenomenon that we will try to clarify. This communication will also be the place to present the different outcrops known in Hesbaye and exploited by Neolithic populations.

ALLARD P. (2005) – L'industrie lithique des populations rubanées du Nord-Est de la France et de la Belgique, Espelkamp, Marie Leidorf (Internationale Archäologie 86).

GROOTH de M. E. Th. (1991) – Socio-economic aspects of Neolithic flint mining, a preliminary study, Helinium, 31, fasc. 2, p. 153-189.

GROOTH de M. E. Th. (2011) - Distinguishing Upper Cretaceous flint types exploited during the Neolithic in the region between Maastricht, Tongeren, Liège and Aachen. Gedenkschrift für Jürgen Hoika, Archäologische Berichte 22, Bonn 2011 ; 107-130

04 FLINT RAW MATERIALS FROM LIMBURG (NL) AND CONTIGUOUS REGIONS

Author: Dr de Grooth, Marjorie - independent archaeologist (Presenting author)
Keywords: LIthics
Presentation Preference: Oral

During the Neolithic, in the southern parts of the Netherlands and adjacent areas in Belgium and the Rhineland a wide range of Upper Cretaceous flints of local or regional origin was exploited. In this contribution, attempts at the macroscopic characterization of these flints and of related flint types from exterior outcrops or extraction sites are presented.

05 WORKSHOP PARTICIPANTS - ORIGIN OF THE FLINTS FROM THE LAYER 1A FROM THE SCLADINA CAVE (SCLAYN, PROVINCE OF NAMUR, BELGIUM)

Author: Mr Horevoets, Michaël - Cedarc (Presenting author)
Keywords: Flint, Meuse River
Presentation Preference: Oral

The layer 1A (38.560 B.P. ±1500) from the Scladina Cave (Province of Namur, Belgium), delivered 4110 lithic artefacts at the last counting (Di Modica 2010), including 2771 flints. In 1983, Otte et al. believed all the flint to be marine pebbles. According to Loodts (1998), 96% of these have a Maastrichtian or Campanian of Hesbaye origin (semi-local provenance; 5-25 km) and 4% are a Campanian flint from Hainaut (distant origin; 25-80 km). Concerning the semi-local flints, Loodts however noticed that the collecting area(s) probably (was)were secondary outcrop(s), bearing the cortex alteration. Despite that, she maintained that the collecting area has to be in Hesbaye, no outcrops being known closer to the Cave. Marie-Hélène Moncel (1998) suggested that the flint was collected "in the Meuse River bed, near the site", without any evidence. Di Modica (2010) re-studied the collection and concluded than most of the flint was local. He could not quantify how much exactly and the evidences were slight. The discovery, in the 2010's, of a flint in a strip of Meuse River terrace next to the site (Di Modica, pers. Comm.) opened new perspectives.
During my Master Thesis (2013), we mapped and sampled many terrace strips near the cave. The majority of the (neo)cortex found on the flints collected can be grouped in 5 major categories. All of these neo(cortex) types exist on the artefacts found in the 1A layer of Scladina. The largest size of the collected pebbles strongly corresponds to the size of the complete (or reassembled) pebbles found in the Cave. These evidences seem sufficient to say that at least 72,83% of the flint from layer 1A is of local origin (less than 5 km). The absence of (neo)cortex on many flakes prevents us from any attribution for part of the 27,17% remaining flakes.

06 WORKSHOP PARTICIPANT

Author: Workshop Participant Messiaen, Liesbeth - Ghent University (Presenting author)
Keywords: Flint Quartzite
Presentation Preference: Oral

The samples of flint and quartzite that I can bring come from archeological excavations in the region of the Lower Scheldt Valley of Sandy Flanders, dating back to the 2nd half of the 6th mill cal BC until the 1st half of the 4th mill cal BC (attributed to RMS, Swifterbant and Michelsberg cultures).

The majority of the raw material at these sites consist of locally sourced flint, collected from secondary deposits, but part of the raw material appears to have been procured over larger distances (> 70 km).

07 WORKSHOP PARTICIPANTS

Author: Mr Vandendriessche, Hans - University of Ghent (Presenting author)
Keywords: Mesolithic Western Belgium
Presentation Preference: Oral

The lithic raw materials used on the recently excavated sites from the Upper-Scheldt valley (between Ghent and the French border), Ruien-Rosalinde and Kerkhove-Stuw seemingly diverge in part from the existing general picture of raw material procurement strategies for Final-Palaeolithic/Mesolithic of the Lower-Scheldt valley. Ruien-Rosalinde is a Final-Palaeolithic site dated to the very beginning of the Younger Dryas, whereas Kerkhove-Stuw is an extensive Early- to Late-Mesolithic site. On both sites, the best represented raw material type is the so-called "Scheldt-flint": a dark grey to dark brown moderately coarse-grained flint with light grey inclusions and an often variably preserved cortex, ranging from chalky to rolled and weathered (with a green glauconitic surface and orange/brown subcortical oxidation zone). This flint most likely originates either from extra-local or regional outcrops along the river Scheldt or from the chalk regions in the North of France or the Tournai area. In addition to this Scheldt-flint, at Ruien-Rosalinde, a very coarse-grained dark grey micaceous flint, resembling the quartzite varieties from the region of Tienen (Wommersom and Tienen quartzite) was used. At Kerkhove-Stuw, besides the Scheldt-flint, two other important flint types were exploited by the Early and Middle Mesolithic occupants of the site. The first type is a dark brown to dark yellow moderately coarse-grained, translucent flint, containing many sponge spicules, with a weathered and rough non-chalky cortex. The second type is a dark grey fine-grained and homogeneous, translucent flint with a rather thin, weathered cortex. Hypothetical origins for these raw materials are presumably located in the chalky areas of the Mons basin or the North of France.

08 WORKSHOP PARTICIPANT

Author: Dr Augereau, Anne - Inrap (Presenting author)
Keywords: Neolithic, flint industry
Presentation Preference: Oral

In the southeast Paris basin, during the early Neolithic, three types of flint were used as raw material in the lithic industries. These different flints gave different blade productions, with more or less regularity of the products. First, a majority of artefacts was manufactured in local flint which comes from the Cretaceous formation, and mainly from Campanian chalk. With numerous zones of bad silicification, this flint is a medium to low quality material. The second one was a Bartonian flint, which is of high quality, with an homogeneous matrix. It has a regional origin with the closest outcrop located at 50 km to the north, in the Marne valley, for example at Jablines. The third flint has a fine-grained matrix and is soft to the touch. Its cortex is thick and it doesn't have any zones of bad silicification. Called "fine-grained flint", its exact origin has still not been determined but two hypothesis must be tested: the local hypothesis, where this flint may be a particular and very rare facies of local flint belonging to the Santonian to Campanian levels ; the hypothesis of a distant origin, maybe from the masstrichtian Cretaceous levels knew in Belgium like the so-called Ghlin flint.
This workshop is an opportunity to test these hypotheses about the fine-grained flint by comparing these archaeological samples with different raw materials coming from a wider area. The result of this confrontation will be also an additional data for the knowledge of development of the Western Danubian Neolithic and its regional and extraregional relationships.

09 WORKSHOP PARTICIPANTS

Author: Ms. Devaux, Julie - Université Paris X - UMR 7055 (Presenting author)
Keywords: Lithic, Raw materials
Presentation Preference: Oral

The analysis of lithic assemblages has allowed to highlight significant transformations between the VSG and the Middle Neolithic I. A general change towards the exploitation of local siliceous raw materials has been observed, associated with the disappearance of the networks previously established during the VSG for the distribution of tertiary chert blades. Moreover, a decrease in blade production, a simplification of the knapping methods and the appearance of new tool types have been recognized. Nevertheless, the Middle Neolithic I of norther France is not well-known and even if this general trend may be accurate, the situation seems much more complex and more diversified from region to region. Therefore, a better characterization of the lithic assemblages of the Middle Neolithic I of northern France is necessary. This workshop is an opportunity to learn how identify and characterize the different chert types available in northern France and in its neighboring regions.

10 WORKSHOP PARTICIPANTS

Author: Halbrucker, Éva - Ghent University
Co-Author: Fiers, Géraldine - Ghent University (Presenting author)
Keywords: raw material characterisation
Presentation Preference: Oral

Our project aims at analysing the characteristics and weathering of different flint raw materials in order to investigate the preservation of use-wear traces on Prehistoric artefacts. The flint types included in this project have been found on recently excavated Prehistoric sites located in the Upper- and Lower Scheldt valley, Belgium. The raw materials will be presented by Liesbeth Messiaen and Hans Vandendriessche (Archaeology Department, Ghent University) during the session. In our project, we use traditional techniques such as microscopic analysis, XRF and SEM-EDX as well as new, non-destructive ones such as micro-CT, in order to obtain 3D information about flint characteristics and weathering features. This conference session is a good opportunity for us to get familiarised with other flint types of the area of our interest (North-Western Europe).

338 MAPPING AND MODELLING PAST LANDSCAPES TO AID ARCHAEOLOGICAL HERITAGE MANAGEMENT AND INTERPRETATION OF THE ARCHAEOLOGICAL RECORD.

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Smit, Bjørn (Netherlands) - Cultural Heritage Agency of the Netherlands
Co-Author(s): Meylemans, Erwin (Belgium) - Agentschap Onroerend Erfgoed Vlaamse Overheid
Keywords: palaeolandscapes, GIS-modelling, past behaviour, heritage-management
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The understanding of past landscapes is crucial for the understanding of human behavior in the past. The landscape of the past was not so much the scene of the activities of man but an integral part of the way of life in the prehistory. Especially in areas with thick Holocene sediments (like coastal zones or river deltas) several or parts of these past landscapes have been buried and are therefore still present to be studied by both geologist and archaeologists. Knowledge of these landscapes not only is crucial for archaeological heritage management (where are archaeological remains likely to be preserved) but also for the interpretation of discovered archaeological remains (what have people been doing in the past).

This session aims to bring together both archaeologists, physical geographers/geologists and researchers of palaeo environments to discuss this topic. It is the aim that the focus on different scales (national, regional and local) will not only trigger new and different research questions but also that discussing these scales and their use will generate insights which can be used in future archaeological research and heritage management decisions.

01 INTRODUCTION TO SESSION 338: MAPPING AND MODELLING PAST LANDSCAPES, DIFFERENT SCALES AND USE.

Author: Smit, Bjørn - Cultural Heritage Agency of the Netherlands (Presenting author)
Co-Author: Meylemans, Erwin - Agentschap Onroerend Erfgoed Vlaamse Overheid
Keywords: paleolandscapes, modelling, use
Presentation Preference: Oral

In this short introduction the aim an goals of this session will be highlighted. The why and how of past landscape reconstruction in the Lowlands and the way these landscapes or reconstructions have been used in archaeological research. It is the aim that the focus on different scales (national, regional and local) will not only trigger new and different research questions but also that discussing these scales and their use will generate insights which can be used in future archaeological research and heritage management decisions.

02 MODELLING MIDDLE PALAEOLITHIC CLIMATIC DATA BASED ON CHARCOAL ANALYSIS RESULTS: EVIDENCE FROM ABRIC DEL PASTOR AND EL SALT (EASTERN IBERIA)

Author: Vidal-Matutano, Paloma - Universitat de València; Université Côte-d'Azur, CEPAM, CNRS, France
Co-Author: Pardo-Gordó, Salvador - Universitat de València (Presenting author)
Keywords: Charcoal, modelling, palaeoenvironment
Presentation Preference: Poster

Botanical identification of charcoal fragments from two Middle Palaeolithic sites located in Eastern Iberia provided significant palaeoenvironmental data where different plant formations are represented: extended coniferous woodlands dominated by junipers (Abric del Pastor, MIS 5/4) and scots pines (El Salt, MIS 3) and Mediterranean mixed forests made up of evergreen and deciduous taxa together with xerophytic shrubs species and riverine taxa. The palaeoecological data from both sites is indicative of a local landscape characterized by the prevalence of supramediterranean conditions (i.e. MAT 8-13 ºC) where the main change over the chronological frame studied is that relative to the precipitation regime: whereas semi-arid prevailing conditions (MAP 200-350 mm) were present during Abric del Pastor human occupations, those from El Salt took place under sub-humid conditions (MAP 600-1000 mm). Based on palaeoenvironmental data from these Middle Palaeolithic contexts, we present the results of a study geared toward the characterization of the local landscape by using GIS software. The combination of current climatic data (MAT and MAP) from the available weather stations of the study area with suitable calculations allowed us to obtain meaningful insight into past climatic simulated values and biogeographic conditions. In consonance with charcoal analysis results, our simulated biogeographic data point towards a 650-700 m altitudinal descent of supramediterranean plant communities. The modelling of past distribution climatic values (temperature and precipitation) provided significant cartographic data highlighting existing nuances between areas, which helped to discuss the theoretical geographic distribution of the taxa identified from charcoal analyses. In conclusion, the simulated scenarios created by GIS-modelling contributed to our better understanding of past landscapes and the firewood catchment area of Neanderthal groups from Eastern Iberia.

03 MAPPING REGIONAL VEGETATION DEVELOPMENTS IN TWENTE (THE NETHERLANDS) SINCE THE LATE GLACIAL AND EVALUATING CONTEMPORARY SETTLEMENT PATTERNS

Author: Dr Van Beek, Roy - Wageningen University & Research (Presenting author)
Keywords: palynology, mapping, archaeology
Presentation Preference: Oral

Interdisciplinary, landscape-oriented studies from an archaeological viewpoint in the Low Countries mainly concentrate on cultural and economic research questions. Focal points are the physical setting of settlements and cemeteries, land use patterns and subsistence economy. As a result, the collected data are rather site-based and one-dimensional. In this lecture it will be argued that it is essential to expand our scope by studying human-land relations in a wider spatio-temporal context. This will be illustrated by means of a regional and diachronic study on the development of the landscape, vegetation and habitation of Twente (the Netherlands) since the Late Glacial. A detailed search for pollen data yielded a large quantity of data from a wide variety of sampling contexts. To use these data for a regional vegetation reconstruction a new interpretative method was developed, using the inherent relation between landscape, vegetation and human activity. A series of evidence-based regional vegetation maps were created, which serve as first-stage generalised models that predict regional trends, allow subsequent testing and place site-specific archaeological data in a wider context. A comparison with contemporary habitation patterns, based on archaeological and historical data, reveals spatio-temporal trends in human influence on vegetation and in physical factors influencing site location. Furthermore, the maps were 'translated' into artist impressions to inform both the academic and wider community.

04 LANDSCAPE IN PRIMEVAL FOREST - FIRST EXPERIENCES AT BIAŁOWIEŻA FROM MULTIDISCIPLINARY PERSPECTIVE

Author: Dr Wawrzeniuk, Joanna - Institute of Archaeology, University of Cardinal Stefan Wyszynski in Warsaw
Co-Author: Prof Urbańczyk, Przemysław - Institute of Archaeology, University of Cardinal Stefan Wyszynski in Warsaw; Institute of Archaeology and Ethnology, Polish Academy of Sciences; Dr Budziszewski, Janusz - Institute of Archaeology, University of Cardinal Stefan Wyszynski in Warsaw; MA Jakubczak, Michał - Institute of Archaeology, University of Cardinal Stefan Wyszynski in Warsaw; Institute of Archaeology and Ethnology, Polish Academy of Sciences; MA Rutyna, Magdalena - Institute of Archaeology, University of Cardinal Stefan Wyszynski in Warsaw; MA Szlązak, Roman - Institute of Archaeology, University of Cardinal Stefan Wyszynski in Warsaw; MA Szubski, Michał - Institute of Archaeology, University of Cardinal Stefan Wyszynski in Warsaw (Presenting author); Prof Jędrzejewska, Bogumiła - Mammal Research Institute, Polish Academy of Sciences; Dr Samojlik, Tomasz - Mammal Research Institute, Polish Academy of Sciences
Keywords: Białowieża, ALS, interdisciplinary
Presentation Preference: Oral

Białowieża Forest is the largest consistent forested area in Poland. In total, it occupies nearly 1,500 km2, of which 42% is in our country and the rest is located in Belarus. This area is almost entirely considered as protected area, including strict reserve in the form of the Bialowieza National Park. Executed in different ways protection of this forest lasts continuously since the sixteenth century. On the one hand, such situation results in better preservation of the remnants of an older settlement, but on the other hand forest cover made the area almost inaccessible for archaeologists. Only technology development of airborne laser scanning (ALS) allowed to change this situation. Launched in January 2017 project "Cultural and natural heritage of Białowieża Forest," aims at a comprehensive, interdisciplinary examination of the archaeological resources of the forest analyzed with the support of the natural sciences. The plan is to map all traces of anthropogenic and natural sites of its own form using ALS, their verification supported by geophysical surveys and test excavations. Already the first season of research provided extremely interesting examples of cultural landscape. Particularly noteworthy are systems of arable fields which are yet difficult to date. The most interesting, however, are complexes that include settlements, arable fields and accompanying sepulchral features, usually in the form of barrows. A very large number of preserved features, in particular traces of exploitation of forest resources (production of charcoal, wood-distilling, military remains etc.), create a unique landscape of primeval forest.
Nonetheless, the Białowieża Forest is an example of extremely rare areas where landscape IS NOT messy in terms of Dimitrij Mlekuz idea - it is rather insular, isolated. To make it a mindful subject of heritage management and available for the public is one of important aims of our project.

05 ANCIENT ANTHROPOGENIC LANDSCAPES IN MOUNTAINOUS DAGESTAN (EASTERN CAUCASUS, RUSSIA)

Author: Ryabogina, Natalia - Institute of the problems of Northern development, SB RAS (Presenting author)
Co-Author: Korobov, Dmitry - Institute of Archeology of RAS; Idrisov, Idris - Geology Institute of the Dagestan Scientific Center RAS; Bakushev, Marat - Institute of History, Archeology and Ethnography of the Dagestan Scientific Center of RAS; Borisov, Alexander - Institute of Physico-Chemical and Biological Problems of Soil Science RAS
Keywords: GIS-modelling, agrolandscapes, paleoenvironment
Presentation Preference: Oral

Over the past decade, a complex of geographic and archaeological methods has been actively used in the study of ancient agrolandscapes in the North Caucasus (Kislovodsk Basin). But in this paper we present a new study targeted at explore of cultural heritage of the ancient and medieval population of the mountainous Dagestan (Eastern Caucasus, Russia) and focus on the first results of studying the land-use features and on the environmental background.
The general ideas about the scale of ancient terracing of the slopes and history of agricultural development in the mountainous Dagestan were obtained using soil science data, archeology, geochemistry and GIS technologies. As a result, the distribution of different types of agricultural terraces on the vast territory was mapped, the total area of terraced fields reaches 1500 km2. Some of the terraces were created with the help of hoeing, others were plowed up by plow. The lower boundary of the terracing zone is located at the level of 900 m, the upper line of distribution in some areas reaches 2,400 m. Based on the localization of archaeological sites, mapped areas of terraced agriculture and according to the analysis of ceramics into the arable layer, we found out that time of the creation of the most ancient terraces began with the Middle Bronze Age (about 2000 years BC).
GIS and paleo-soil surveys in mountainous Dagestan are supplemented by palynological research. Mountain peat Shotota - a unique site in this area, includes record of natural changes of the last 6000 years. The complete profile of natural archive deposits was analyzed in this region for the first time, it gave a new information about forest cover and vegetation of the slopes at different times both under the influence of the climate and because of the development of agrolandscapes.

06 THE CULTURAL LANDSCAPE OF TVER UEZD OF MUSCOVY OF THE 16TH – 17TH CENTURIES

Author: Mr Kutakov, Sergey - State Academic University for the Humanities (Presenting author)
Keywords: GIS, rural settling
Presentation Preference: Oral

From the first half of the 16th century we have the first land cadastral descriptions of Tver uezd. Tver uezd of Muscovy is a territory around Tver – the center of the Grand Principality of Tver in the middle of 13th century – 1485. We are reconstructing the rural settling in Tver uezd on the data of the cadastral books of the 16th –17th centuries and the materials of the General land survey of the late 18th century and other maps and descriptions. The research uses GIS based on QGIS software. The GIS-layers include data on the large settlements, temples and monasteries mentioned in the descriptions of 1539/40, 1551-1554 and 1580. The results published at http://english.histgeo.ru/tvereng.html .
The localization of the toponyms of the written sources allows to track the dynamics of rural settling in Tver uezd and make the comparison to archaeological data.
GIS is the instrument of monitoring of the archaeological sites. It allows to correlate the toponyms of the written sources to the archaeological settlements and to reveal the archaeological sites.
The archaeological data (mainly ceramic material) allows to research the chronology of the settlements and the historical dynamics of the settling system and territorial administrative division in the 14th – 17th centuries within certain landscape areas.

07 A MIDDLE TO LATE IRON AGE LANDSCAPE IN WESTERN THE HAGUE, THE NETHERLANDS.

Author: Drs. Rieffe, Christiaan - Gemeente Den Haag (Presenting author)
Keywords: paleolandscapes, GIS-modelling
Presentation Preference: Oral

Archaeological investigations during the renovation of existing sewer systems in an early twentieth century residential area, "de Vogelwijk", in The Hague provided information on the former landscape and it's use in late prehistory. To help the interpretation of the archaeological record, the former landscape was modelled with a combination of GIS-tools. Indicators of human activities are less easy to quantify and thus model on the same scale as the landscape. We have however devised a method to model these as well.
As a result, after four phases of sewer renovation, over a period of 10 years, we have a detailed picture of a part of the Dutch coastal region. That picture is by no means a flat pancake, it is a landscape rich in relief.

08 UNDERSTANDING ASPECTS OF THE HOHOKAM SOCIETY WITH A MODELING APPROACH GROUNDED ON DIFFERENT DATASETS OF THE ARCHAEOLOGICAL RECORD

Author: Xanthopoulou, Themis-Dimitra - Department of Archaeology, Leiden University (Presenting author)
Co-Author: Dr Woodson, Michael Kyle - Cultural Resource Management Program, Gila River Indian Community, Sacaton, Arizona; Dr ir Ertsen, Maurits - WRM, CiTG, Delft University of Technology; Dr Kolen, Jan - Department of Archaeology, Leiden University
Keywords: ancient irrigation, human-agency
Presentation Preference: Oral

Hohokam is the term used to describe the Native American culture of the inhabitants of the Sonoran desert (and more specifically the area of modern Phoenix, Arizona) in the first and second millennia AD. Hohokam decline, expressed in terms of depopulation, has long troubled researchers. Many studies have highlighted a link with water scarcity. Indeed, Hohokam society's agriculture was supported with larger-scale irrigation systems. In this paper, we will present a modelling framework that allows exploration of aspects of the daily life of the Hohokam in relation to irrigation. We focus on four main tasks of irrigation: construction of irrigation facilities, maintenance and operation, allocation of water and resolution of conflicts that arise. We test whether the concept of 'irrigation community', defined as a group of people that take irrigation-related decisions together, can be used as a base to explain the long-term trends observed in the archaeological record. The basic components of our methodology are a long-term model that links population size with hydrology and agriculture, a short-term agent-based model that captures daily aspects of irrigation, and an updating process to keep the two models aligned and to validate model outcomes against archaeological data. The archaeological data by themselves do not provide the short-term activities we need to understand irrigation stability. The short-term actions and their results within the irrigated landscape are covered in the short-term model, which is the place within which agents interact. The many potential outcomes of these short-term actions are constrained by both the longer-term model based on observations and the archaeological data sets. This methodology promises the ability to formalise the link between daily actions with the gradual rise and decline of the Hohokam.

09 TRONDHEIM'S POMPEII: AN INTERDISCIPLINARY APPROACH TO THE EMERGENCE OF AN URBAN SETTLEMENT IN A FLUVIAL LANDSCAPE.

Author: Senior Archaeologist Petersen, Anna - Norwegian Institute for Cultural Heritage Research (Presenting author)
Co-Author: Prof Christophersen, Axel - Norwegian University of Science and Technology; Dr Hansen, Louise - Norwegian Geological Survey
Keywords: Trondheim, riverplain, earlymedieval
Presentation Preference: Oral

Trondheim is located in mid Norway. Its historic nucleus occupies a central part of the river plain where the River Nid (Nidelva) enters Trondheimsfjorden.
The present-day landscape is a result of a continuous emergence of land and shoreline regression due to glacioisostatic uplift since the last Ice Age, in combination with fluvial processes and human occupation during the Holocene. The first evidence of human settlement on the riverplain dates back to ca. 2,500 BP.
In the late Viking Age and the early medieval period c. AD 900 – 1100, a non-agrarian settlement expanded in the eastern part of the river plain, near two inlets in the main watercourse's western bank. The inlets may have been formed due to channel abandonment during uplift, perhaps aided by landslide activity. The inlets were sheltered from harsh weather conditions and providing good harbour facilities, which was a key factor in the rise of the early medieval settlement. Recent archaeological findings of occupational deposits from Viking Age/ Early Medieval times in the southern inlet's north-eastern side, sealed by fluvial sands causing "a Pompeii-effect", is a illustrative example of the powers in the dynamic landscape of the river plain and the delta area. It also provides solid grounds for a comprehensive spatial analysis to identify the criteria for the choice of the original settlement site, and the practical challenges involved in establishing a non-rural settlement.
This paper aims to discuss the relationship between geology, hydrology, paleo-ecology and human impacts in relation to complex landscape-formation processes and land use. The goal is to establish a broad empirical basis for an ever-more detailed understanding of the establishment of the late Iron Age/early-medieval urban settlement and the natural preconditions.

10 NO COUNTRY FOR MEN. A LANDSCAPE RECONSTRUCTION OF THE MEDIEVAL BATTLE AGAINST THE ZUIDERZEE, THE NETHERLANDS (A.D. 1100-1400)

Author: Drs. van Popta, Yftinus - University of Groningen (Presenting author)
Keywords: Reconstruction, maritime, Zuiderzee
Presentation Preference: Oral

The central part of the Netherlands has a very dynamic Holocene past as it developed from land into sea into polder. The polders are now known as the province of Flevoland but were once part of the Zuiderzee region. This region was under influence of the Zuiderzee (Southern Sea), a large inlet of the North Sea that existed between the late middle ages and A.D. 1932. Heavy floods, the loss of lives and economic damage made the Dutch eventually decide to dam and reclaim part of the Zuiderzee.

This paper focuses on the polder that corresponds to the northeastern part of the Zuiderzee region, called the Noordoostpolder. The nowadays calm and open landscape of meadows, fields and farms conceals the historic battle that was fought against the water on the vulnerable, undefended yet cultivated and inhabited peatlands. Although there are many traces of medieval habitation, peat reclamation, (lost) islands, diking and landscape dynamics, the late medieval appearance of the region has remained a mystery until present day. It is often believed that reconstructing it is pointless as most of the medieval landscape has eroded in time. However, a spatial focus on the interrelation between disciplines like landscape history, geology, archaeology and history might provide new insights on the past landscape. Especially when adopting the concept of the maritime cultural landscape as invented by Westerdahl in 1992.

The aim of the research is to map and model the dynamics of the Noordoostpolder landscape between A.D. 1100 – 1400, including the presence and influence of humans. Only then it will lead to a proper understanding of human behavior and the way of life in the late medieval Zuiderzee region. This is crucial for protecting the still present medieval archaeological heritage and understanding the scatters of archaeological evidence.

11 THE NEW GEOMORPHOLOGICAL AND ARCHAEOLOGICAL PREDICTIVE MAPS OF THE DUTCH MEUSE VALLEY

Author: Dr. Isarin, René F.B. - Crevasse Advies (Presenting author)
Co-Author: Ing. Ellenkamp, Reinier - RAAP Archaeological Consultancy BV; Drs. Heunks, Eckhart - Eckhart Heunks Landscape Archaeology; Dr. Rensink, Eelco - Cultural Heritage Agency of the Netherlands (RCE)
Keywords: predictive map Meuse-valley
Presentation Preference: Oral

The Dutch Meuse Valley, located between Maastricht and Cuijk, plays a major role in the national water-management efforts to decrease the risk of flooding during high river discharges. The necessary space to temporarily store excessive river water is realized by digging new river channels and by extensive lowering of the floodplain surface. However, the required plan areas contain a wealth of archaeological sites spanning the last 10.000 years. Recent large - scale excavations have shown that research cost may be very high, potentially endangering realization of the water safety aims. The scope of future water-management projects, in total at least 5000 ha in the oncoming decennia and potential costs, asked for optimization of research strategies, data synthesis and policy. As a result, a geomorphological map and a series of archaeological predictive map for the Meuse Valley were produced, in 2014 and 2015 respectively. The maps include the fluvial and aeolian landscape forms within the Holocene floodplain and Late Weichselian Younger Dryas river terraces of the Meuse. For the first time Meuse Valley geomorphology and archaeology are combined for this 165 km long stretch of the Meuse River. The archaeological maps provide predictive information on site location for four distinct consecutive archaeological periods and four main cultural themes. The maps contribute to a better understanding of landscape processes (fluvial and aeolian geomorphology and the impact of man on river behavior), and the possibilities for human habitation and land-use in prehistoric and historic times. On the practical side, the maps may facilitate spatial planning and risk-management. Our contribution aims at describing the conception, the underlying models and the main features of both maps.

12 CONE PENETRATION TESTING FOR PREHISTORIC LANDSCAPE MAPPING IN THE SCHELDT FLOODPLAIN (NW BELGIUM)

Author: Verhegge, Jeroen - Ghent University department of archaeology; Geosonda environment nv (Presenting author)
Co-Author: Crombé, Philippe - Ghent University department of archaeology
Keywords: Cone Penetration Testing
Presentation Preference: Oral

Well-preserved Late Glacial to Mid Holocene paleolandscapes containing prehistoric sites have been found, buried deeply below Holocene peat and estuarine floodplain deposits of the Scheldt river. These finds occurred by accident during harbor infrastructure works and triggered prompt rescue excavations. Therefore, cone penetration testing (CPT) for paleolandscape mapping was introduced often in combination with coring and/or electromagnetic induction survey.
CPTs are often already (freely) available by the time an archaeological evaluation is started and additional data are acquired easily. Applications range from the determination of appropriate paleolandscape evaluation strategies during archaeological desktop studies to actual paleolandscape mapping. During an archaeological paleolandscape evaluation, well-chosen located CPTs (in combination with additional sensors) complement and validate sedimentological interpretations of near surface geophysical survey data. Alternatively, CPTs serve as an independent survey technique when other methods are impractical and/or ineffective. For example, due to high data resolution even deeply buried and thin soil horizons dating back to the Allerød within geophysically homogeneous sediments can still be mapped using CPTs. For ease of communication with (geo-)archaeologists, CPT-interpretation into soil behavior types approximates lithological units but these interpretations are validated by limited coring.
The effectiveness of CPT will be illustrated through recent prehistoric landscape evaluations, mapping deeply buried dunes, natural levees and point bars along the Scheldt river, which proved favored locations for Final Paleolithic to Early Neolithic occupation.

13 MODELLING PREHISTORIC LANDSCAPES IN THE LOWER THAMES VALLEY (LONDON, UK): A CASE STUDY FOR PREDICTING ARCHAEOLOGICAL AND PALAEOENVIRONMENTAL POTENTIAL

Author: Dr Batchelor, Rob - University of Reading (Presenting author)
Co-Author: Dr Young, Daniel - University of Reading; Dr Green, Chris - University of Reading; Mr Espinosa-Valdor, Adrian - University of Reading
Keywords: Prehistoric, landscapes, modelling
Presentation Preference: Oral

Several years of geoarchaeological investigation on the floodplain of the River Thames, arising from archaeological mitigation of construction impacts, have resulted in a database of over 3000 stratigraphic records for the Isle of Dogs and Greenwich Peninsula areas of London. This dataset has been used to develop a high-resolution spatial and temporal model of the prehistoric floodplain landscape, providing an opportunity to assess the potential of such a model as a predictive tool for identifying evidence of human activity and for locating thick sequences of palaeoenvironmental potential.
The models have revealed a number of topographic features of interest in this area of the River Thames floodplain, including gravel highs and Late Devensian/early Holocene channels which would have been significant components of the landscape during the prehistoric period. The models demonstrate that in general, greater thicknesses of alluvium are recorded in areas of lower gravel topography as might be expected, but that peat thickness shows a less predictable relationship with the underlying gravel topography. The distribution of the known prehistoric archaeology (for example, wooden trackways and platforms) suggests that such sites have thus far only been recorded in areas of gravel 'highs' (generally above -1m OD), and that many of the sites are recorded where the peat is either relatively thin (<1m) or absent; however, the depth of the sequences here (in places up to 10m) may have impacted on the identification of such sites.
The model highlights the importance of larger-scale deposit models in areas subject to intensive redevelopment, and demonstrates that such models can be a useful tool for identifying areas of both palaeoenvironmental and archaeological potential, and for archaeological heritage management in floodplain environments.

14 PALAEOGEOGRAPHICAL TIME SERIES MAPS OF THE PLEISTOCENE AND HOLOCENE LOWLAND LANDSCAPES IN AND AROUND THE NORTH SEA.

Author: Dr. Cohen, Kim - Utrecht University, Dept. of Physical Geography; Deltares, Dept. of Applied Geology and Geophysics; TNO - Geological Survey of the Netherlands (Presenting author)
Keywords: Palaeogeography, Landscape Archaeology
Presentation Preference: Oral

Palaeogeographical time series maps provide powerful text figures that narrate the chronological story of landscape change in prehistoric and historic times in a quite accessible way. They inspire and communicate the broad idea of developments quickly, no matter how the maps are produced (essentially by hand, computer aided, model output visual) and are intended (as sketch, as a possible scenario, as the utter truth on past landscape reality).

If palaeogeographical maps are produced more formally, are digitally generated from source data and carry information that allows to track back to evidence and interpretive decisions, the map series become even more powerful. It makes the map series direct summaries of geological, geomorphological and archaeological data, that are pre-organized for time-sliced spatial analysis that just simply uses the map, and are equally prepared for validation and improvement of the landscape reconstruction that the series visualises.

The formal digital approach is what we pioneered in the Rhine-Meuse delta since 1998, what we have expanded to the Netherlands and surroundings, onshore and offshore since 2011, and of which we will present various results in archaeological usage context at this conference.

339 CREATING NEW SCENARIOS FOR ARCHAEOLOGY: NEARCHING FACTORY RELOADED

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author: Varela, Rocío (Spain) - INSTITUTE OF HERITAGE SCIENCES, SPANISH NATIONAL RESEARCH COUNCIL
Co-Author(s): Sánchez, Raquel (Spain) - INSTITUTE OF HERITAGE SCIENCES, SPANISH NATIONAL RESEARCH COUNCILSynnestvedt, Anita (Sweden) - UNIVERSITY OF GOTHENBURG
Keywords: NEARCH, sustainability, social innovation
Presentation Preference: Session with a key note speaker with contributions from discussants and discussion
Speaker: Felipe Criado-Boado

The NEARCHing Factory Session "Creating new scenarios for Archaeology: Nearching Factory reloaded" at the EAA Conference will be based on NEARCHing Factory outcomes. Outcomes from two and a half days of work, learning and ideas exchange, by heritage professionals from all around Europe.
NEARCHing Factory purpose is, taking into account the difficult situation of the archaeological sector, to re-think the practice of archaeological activity (i.e. archaeological as a way of life and of making a living) to build, in collaboration with others, a process for the creation of new scenarios that can help to sustain the activity. It will be reached through the different "thinking together" plenary sessions and especially through the work done in the different working groups, focused on ten different topics relevant for archaeology (Digital Capabilities for Sustainability; Participative Heritage Management; Professional Regulations and Codes: Sustaining the Archaeological Profession; Arts and New Heritages; Archaeology of the Present; Heritage value(s); Social Innovation and Archaeology; Archaeology, Spatial Planning and Economic Development; Archaeology and School & Archaeology for Long-Life Learning; and Archaeologies of/for Future).
The purpose of the NEARCHing Factory Session is, therefore, apart from presenting these outcomes to a broader audience of heritage professionals and getting their feedback, to continue the work started at NEARCHing Factory, to continue re-thinking the practice of archaeological activity, to have a deep discussion about it, with the aim of getting some consensual agreements to sustain continuous development of the archaeological profession and foster new sort of practices as part of this.

01 WHAT IS NEARCHING FACTORY?

Author: Research technician Sánchez Martín, Raquel - INSTITUTE OF HERITAGE SCIENCES, SPANISH NATIONAL RESEARCH COUNCIL (Presenting author)
Co-Author: Dr Barreiro, David - INSTITUTE OF HERITAGE SCIENCES, SPANISH NATIONAL RESEARCH COUNCIL; Research assistant Varela Pousa, Rocío - Institute of Heritage Science (Spanish National Research Council)
Keywords: Nearching, factory, archaeology
Presentation Preference: Oral

In this session we will present NEARCHing Factory.
NEARCHing Factory took place from 30th January to 1st February in Santiago de Compostela within the framework of the NEARCH project. Over 90 people from 17 different countries, from different professional sectors and working areas participated in this event.
The main objective, given the crisis that affects the archaeological sector, was to re-think the practice of archaeology (i.e. archaeological as a way of life and of making a living) in order to build a process for the creation of new scenarios to sustain the archaeological activity.
It was a political activity (in its wider meaning) because it was about designing proposals of action; and it was not about only attending but about actively participating, unlearning, sharing and creating alternatives together with others.
It was a ´factory´, in other words, a workspace where ideas can be transformed into something more specific by means of collective effort.
It was conceived as a process and not only as an event situated in a specific moment and space. Months before the meeting, some online debates had been opened where concepts and positions were discussed, that were also addressed at the event in Santiago de Compostela. When the event finished, the work continued.
Participatory methodologies and tools were used to facilitate the active and creative intervention of people interested, in a direct way or through social media; before, during and after the event, and always trying to promote multivocality. Therefore, the event was organized in reduced thematic working groups; it was used a system using coloured cards oriented to promote anonymous questions, criticism and comments about each session; and were put into practice methodologies as the World Café and Exquisite Corpse.
The main ideas addressed in the different working groups will be briefly presented.

02 IDEAS FOR IMAGING NEW ALTERNATIVE SCENARIOS IN ARCHAEOLOGY

Author: Dr Barreiro, David - Incipit, CSICMs Varela-Pousa, Rocio - Incipit, CSICMs Sánchez-Martín, Raquel - Incipit, CSIC
Co-Author: Professor Dr Criado-Boado, Felipe - Incipit, CSIC (Presenting author)
Keywords: innovation, Professionalism, Sustainability
Presentation Preference: Oral

In the key note of the session, we're going to present the main ideas worked and emerged in the NEARCHing Factory, with the aim of submitting them for discussion among those attending the session.
The Project "Discovering the Archaeologists of Europe" has made an X-ray of the archeology sector in Europe, highlighting the critical situation in many countries. In addition, new actors are emerging that demand new (more participatory) roles in the management of cultural heritage. In this context, we need a new scenography for the future, a renovation of the concept of scientific and heritage practices, and the very understanding and valuing of heritagization processes.
The aim of this presentation is to promote the debate about the future economic scenarios for archaeology, including the possibility for a radically alternative economic scenario for Heritage as a broader field of activity. The discussion deals with 3 central questions:

- Is possible an economic use of Heritage, but being sustainable and alternative to the existing?
- In what ways can and must archaeology change to be adapted to the new models of activity that are emerging?
- How can archaeology contribute to this process of transformation of the hegemonic paradigm? How can contribute to the present discussion on Economics Theory to overcome the neoclassical paradigm?

03 ARCHAEOLOGY AND THE NEW CITIZENS

Author: Dr van den Dries, Monique - Faculty of Archaeology, Leiden University (Presenting author)
Keywords: inclusion, migrants, NEARCH-survey
Presentation Preference: Oral

Since many decades, the Netherlands welcomes thousands of new inhabitants every year. Integrating migrants in all aspects of societal life, also in culture and heritage, is at the top of the political agenda. The cultural sector is encouraged to be inclusive and to stimulate participation by all inhabitants. However, the recent NEARCH public survey shows some worrying trends regarding participation. What is going on? In this paper an analysis is presented of how the dominant neo-liberal socio-economic policy encourages heritage elitism rather than inclusion and diversity and what effects this may have on the future of archaeology.

340 HIDDEN STORIES: 3D TECHNIQUES AS TOOLS FOR EXPLORING ARCHAEOLOGICAL ASSEMBLAGES

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Hilditch, Jill (Netherlands) - University of Amsterdam
Co-Author(s): Molloy, Barry (Ireland) - University College Dublin
Keywords: 3D modelling, technology, assemblage analysis
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Recent advances in the use 3D digital modelling technology, such as archaeological morphometric analysis, have the capacity to change the way we look at material culture. These techniques have allowed detailed comparison of characteristic features of objects that can shed light on the 'hidden stories' of artefacts, which can enhance their role within multi-scalar investigations. In short, 3D digital modelling challenges the ways we study, document, interpret and present material culture. However, the visualisation of unique objects or key features, essentially looking at distinct and small datasets within larger artefact assemblages, has dominated the field to date. This session seeks to take the applications of the approach further and to discuss the progression of 3D capture and modelling from individual and small-scale object analysis into a valuable tool for

routine and assemblage scale analyses.
We invite papers that discuss the application of 3D technologies at the assemblage level, with a view to addressing their role in data acquisition, workflows and artefact interpretation. In particular, we wish to assess the evolving theoretical framework within which 3D models play a role in material culture research and to explore how robust this can be. Topics can include:

- Feasibility and reliability of automated data collection and interpretation;
- Issues in balancing resolution (quality) and quantity of datasets;
- Using 3D techniques to solve problems of reconstruction and replication;
- New technologies (instrumentation and software) and methodologies aimed at widening the scope and scale of 3D applications within archaeology.

01 MODELLING CLAY: EXAMINING LONDON AND NEW WORLD PIPE CLAY FIGURINES FROM THE 16TH TO 19TH CENTURIES USING 3D MODELLING TECHNIQUES

Author: Miss Crichton-Turley, Courtenay-Elle - University of Sheffield (Presenting author)
Keywords: 3D, post-medieval, figurines
Presentation Preference: Oral

The following paper will present elements of my PhD research on documenting and contextualising London's post-medieval pipe clay figurines from the 16th - 19th century, coupled with the use of automated 3D model-matching to examine figurine production and distribution. The results of this project have improved our understanding of figurine mould generations and showcased the potential of linking figurines made by the same mould.

This paper will highlight findings based on datasets of material found in London and the U.S., collated during this project, focussing on the processes used for automated figurine matching, as well as how this methodology can help to further improve and inform understanding of figurine production and distribution. The work presented will include tests carried out on the accuracy of the NextEngine laser scanner and CloudCompare software, as well as the methodology used for measuring and interpreting surface area errors and variabilities that arise during the figurine firing process. Both the methodology and application of 3D figurine matching will then be presented in connection to the positive results which have been collated so far, displaying trans-Atlantic figurine matches, which have helped in developing interpretations of figurine distribution. Furthermore, positive results demonstrating a potential example of mould generations occurring between a set of three figurines from the London assemblage will also be discussed.

The work presented in this paper combines work on a little-appreciated dataset of material culture from Britain with techniques that have a wider scope for aiding our understanding of production and distribution of mould-made artefacts in as cost-effective a manner as possible.

02 A THEMATIC USE OF 3D MODELS AS TOOLS FOR EXPLORING PREHISTORIC CONFLICT

Author: Dr. Molloy, Barry - University College Dublin (Presenting author)
Co-Author: Mr. Pendić, Jugoslav - BioSense Institute, Novi Sad; Mr. Mariusz Wisniewski, Mariusz - Wojewódzki Urza¸d Ochrony Zabytków w Warszawie; Dr. Milić, Marina - University College Dublin
Keywords: 3D, warfare, conservation
Presentation Preference: Oral

Assemblages take many forms, from material found together at a single site through to categories of objects of similar form. This paper takes a different perspective and considers the role of 3D models for exploring a range of complementary tools from prehistory that were used for violent conflict. More specifically, it assesses the potential role of 3D modelling for augmenting the documentation and presentation of damage associated with combat use and taphonomic / post-depositional processes (and telling these apart in some cases).
It does this by examining metal, leather and wooden objects from Bronze Age Ireland. This combination of materials enables us to explore some of the material specific challenges of making models and using the data present on these. This includes addressing problems faced recording objects but also in the post-processing of models to "bring out" key features. The use of models is considered from the perspective of disseminating the findings of the initial study, but also for exploring the potential second-life of models for further analyses by other parties.
Overall, the objective is to assess what contribution, if any, 3D models can make to a thematic field of research in which assemblages are made up of diverse materials with a range of distinct functions that lead to very different traces of use and finally different qualities of preservation.

03 TRACING THE POTTER'S WHEEL – 3D TECHNIQUES FOR VISUALISING, ANALYSING AND INTERPRETING TECHNOLOGICAL INNOVATION IN THE BRONZE AGE AEGEAN

Author: Dr. Hilditch, Jill - University of Amsterdam (Presenting author)
Co-Author: Dr. Jeffra, Caroline - University of Amsterdam; Ms Opgenhaffen, Loes - University of Amsterdam
Keywords: 3D techniques, technology
Presentation Preference: Oral

Advances in 3D scanning and morphometric analysis, more commonly used in archaeology for studying lithic and dental evidence, have recently allowed the traditional domain of ceramic production to join the digital humanities. Ceramic production techniques related to forming can be identified visually based on surface macrotraces and textural analysis of breaks. This approach in effect correlates surface topographies with hand-made and wheel-made (rotative kinetic energy or RKE) pots, as well as vessels produced using combination techniques. The application of 3D scanning, in tandem with specially developed algorithms for visualising these macrotraces on single sherds, can also be scaled-up to help identify characteristic traces of specific forming techniques across an entire ceramic assemblage. In effect, this shifts the analytical focus away from individual artefacts in favour of the technical choices or socially-embedded behaviours within the ceramic production sequence.
This paper presents the methodology of the Tracing the Potter's Wheel Project (UvA) which focuses on the transmission of the potter's wheel as an innovation within ceramic production during the Bronze Age period of the Aegean region. Our project employs a three-fold analytical method, integrating 3D techniques with experimental archaeology and compositional analysis of ceramic materials, to investigate how and where ceramic vessels manufactured using RKE were produced. By analysing key ceramic assemblages throughout the Aegean region, we aim to shed light on the hidden story of the potter's wheel in the Aegean Bronze Age and test the transmission of potter's wheel technologies, or the incorporation of RKE potting into potters' skill sets, across traditionally assumed geographical and chronological trajectories.

04 THROUGH A GLASS DARKLY: THE ROLE OF 3-D VIEWING IN MUSEUMS

Author: Dr Georganas Georganas, Ioannis - University of St Andrews (Presenting author)
Co-Author: Prof Sweetman, Rebecca - University of St Andrews; Ms Hadfield, Alison - University of St Andrews
Keywords: Museums, Entangled Objects
Presentation Preference: Oral

In the last decade Museums have shown increasing interest in making elements of their collections available for viewing through digital media (Arnold-de Simine 2016, 188). Making collections accessible to the public is a fundamental remit of modern museums, and digitisation offers solutions to many of the practical challenges associated with collections care and access. Despite this enthusiasm for digitisation, Parry (2009, 2) notes that it is still difficult to find a central source of policy, advice and resources on digital heritage. The Report from the Culture24 Action Research Project 'Let's Get Real' (2011, 4) found that 'organisations regularly invest in cultural websites, social media activities and online services without a clear idea of what the services are trying to achieve, or their intended audience.' Nor is there an agreed method to measure success in terms of 'user behaviour, engagement and satisfaction' (ibid). Furthermore, little work has been undertaken on the effect that different forms of experiencing objects have on the perceptions of them. To answer such questions we used the digitisation of the Bridges collection of Cypriot material culture at the University of St Andrews to provide empirical data concerning contemporary issues in material culture and museum studies. We undertook a study of 95 individuals of different ages and experience to assess their perceptions of a set of material culture in 4 different media: Viewing the object in a glass case; touching a replica in a sensory box (no sight); interacting with 3D digital versions of the artefacts and finally holding the real object. Our initial results which we will present here, have been revealing in terms of the value of 3D media in museums in terms of user experience and understanding of material culture.

341 WELDING A NEW APPROACH TO THE STUDY OF ANCIENT METALS

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Pearce, Mark (United Kingdom) - University of Nottingham
Co-Author(s): Stöllner, Thomas (Germany) - Deutsches Bergbau-Museum, Bochum; Ruhr-Universität Bochum
Keywords: archaeometallurgy, metals, mainstream archaeology, interpretation
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Two communities have emerged in archaeometallurgy: the archaeologists, largely educated in the humanities, and the material scientists. Killick (2015; Pearce 2016) has illustrated the non-communication and mutual lack of interest in the debates between the two traditions, one focused on the social and symbolic aspects of metalwork, the other interested in techniques of analysis and chemical and mineralogical processes. This session aims to build bridges the two approaches, encouraging collaborative research goals, and thereby to fuse the two in a new understanding.

Archaeometallurgists have their own conferences and journals, so that archaeometallurgical articles rarely appear in mainstream journals, and sessions at general archaeological congresses, like the EAA, are often dominated by discussion of technique rather than the contribution of archaeometric data to the resolving specific archaeological problems. Such sessions are often deserted by the generalist archaeologists who are not interested in technical problems.

Cultural archaeologists are also to blame for this situation, especially because too few really have the specific skills (especially statistical) to use archaeometallurgical data, or an understanding of what specific analytical techniques can and crucially cannot tell us.

We welcome papers from either tradition, that attempt to bridge the divide by discussing the problems inherent in combining the traditions or that interpret archaeometrical data within a framework of archaeological data and hypotheses.

Killick, D. 2015. Archaeometallurgy as Archaeology. In Archaeometallurgy in Europe III: 295-300. Der Anschnitt Beiheft 26. Bochum
Pearce, M. 2016. Archaeology and archaeometallurgy: some unresolved areas in the interpretation of analytical data. STAR 2(1): 46-53

01 SCIENCE VERSUS ARCHAEOLOGY? THE CASE OF THE BERNSTORF FAKE.

Author: Professor Dr Pernicka, Ernst - Curt-Engelhorn-Zentrum Archäometrie gGmbH (Presenting author)
Keywords: LBA gold trade
Presentation Preference: Oral

At the hamlet of Bernstorf near the small town of Kranzberg, Freising district, in Bavaria a number of finds made from gold foil were found near a Late Bronze Age structure in 1998. They were interpreted as clear evidence for contacts between Mycenae and Bavaria in the Late Bronze Age. Furthermore, it was suggested that the gold derives from Egypt based on comparison with gold foil from an Egyptian sarcophagus supposedly belonging to Akhenaten (KV 55, a tomb in the Valley of the Kings in Egypt). However, since this conclusion was at variance with previously published data on the composition of the gold from KV 55, it was re-analysed with LA-ICP-MS together with the gold finds from Bernstorf. It turned out that the Bernstorf gold is exceptionally pure which is not only unknown in natural gold but also in all prehistoric gold objects hitherto analysed. It is therefore concluded that the finds from Bernstorf were made from modern gold foil which is supported by radiocarbon dates of adhering resin and organic debris in the soil coating in which the objects were found.

This conclusion is fiercely rejected by those archaeologist who were involved in the study of the site and its materials. One of the arguments is that this context cannot be interpreted by scientific measurements alone but that archaeological arguments need to be considered. In the presentation it will be discussed, if scientific and archaeological evidence is indeed in disagreement.

02 WHAT IS A DEPOSIT? UNDERSTANDING ORE-GEOLOGY AND THE PREMODERN USAGE OF DEPOSITS

Author: Professor Dr Stoellner, Thomas - Ruhr-University of Bochum; Deutsches Bergbau-Museum Bochum (Presenting author)
Co-Author: Professor Dr Klein, Sabine - Deutsches Bergbau-Museum Bochum; Ruhr-University of Bochum
Keywords: Mining-Archaeology, Archaeometallurgy, Ore-geology
Presentation Preference: Oral

A basic misunderstanding of the premodern usage of (ore)deposits is connected with the criteria what a deposit makes a deposit. It is widely known that often maps are used which were produced on a modern, economic understanding of exploitability. This often leads to a wrong estimation of a raw material landscape. This is also true when qualifying the question what exactly had been exploited as often archaeologists tend to use ores and raw materials found at debris heaps and tailings as indication. This is misleading in many cases for understandable reasons: polymineralic deposit and often their richest and desired parts had been exploited. This influences either archaeometallurgists' and archaeologists' quality arguments (what exactly had been used) and our quantitative estimates. This even more pertains to all sorts of arguments within the nowadays complex and distinctive provenance-study field that seems more and more driven to accomplish smaller analytical detection limits.

The lecture will follow some examples from various mineral resources, ores as well as other minerals to discuss basic misunderstandings and also mistakes made in the fields of mining archaeology and archaeometallurgy. To assess a methodological concept seems a resort to achieve a better understanding of premodern productions.

03 THE CURSE OF THE PXRF

Author: Professor Pearce, Mark - University of Nottingham (Presenting author)
Keywords: pXRF, archaeometallurgy, artefacts
Presentation Preference: Oral

In this paper I shall explore some of the negative consequences of the current popularity of pXRF analysis. There is no doubt that this portable device, which can be taken to museums and sites, has revolutionised the study of the compositions of many classes of archaeological material, but the apparent simplicity of its operation and the generation of analytical results has also created problems, particularly as regards the analysis of metals.
Many archaeologists do not seem to understand that pXRF data generally does not reflect bulk composition. PXRF analyses the surface of an artefact, which is of course subject to weathering and alteration, and, moreover, many elements segregate when the metal is molten. A further problem is that it is becoming more and more common for museum curators to refuse to authorize destructive methods of analysis since pXRF analysis can be effected without damage to ancient artefacts.
The misunderstanding by many archaeologists and curators of the nature and significance of pXRF is illustrative of the misunderstandings that exist between material scientists and archaeologists.

04 ARTEFACT BIOGRAPHY 2.0 AS INTERDISCIPLINARY TOOL IN METAL STUDIES

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Keywords: biography metal information
Presentation Preference: Oral

In this paper it will be shown that an integral approach in object studies enables an exhaustive exploitation of the information potential of metallic archaeological artefacts.

An updated and interdisciplinary version of artefact biography will be presented. In artefact biography 2.0, corrosion, excavation, preservation and future use like storage, display and study are incorporated next to the already included stages of processing, application and deposition in the remote past. The advantages of describing all these life phases of an artefact are exemplified by describing a reconstructed artefact biography 2.0 of corroded archaeological bronze studs from Oss-Zevenbergen, the Netherlands. A plausible manufacturing process is explained, corrosion processes after use are described and contemporary conservation practices are discussed. This will show that a large amount of information can be extracted from equivalent object studies.

The paper will not only be case-study-based, but also incorporate generically applicable information regarding metals research. Corroded artefacts are regularly deselected after excavation, yet this paper intends to show that valuable information from corrosion products may be obtained. Especially the recognition of microstructures to deduce production processes will be highlighted. As conservation practices may hinder analytical research, specific suggestions for conservation relevant for archaeologists are given. The paper aims at awareness of the amount of information even corroded objects contain, which hopefully leads to new research possibilities to ultimately tell the stories of people who have used the artefacts.

05 AN APPEAL FOR BETTER PUBLICATION STRATEGIES BETWEEN ARCHAEOLOGISTS AND SCIENTISTS

Author: Dr Mödlinger, Marianne - IRAMAT-CRP2A Université Bordeaux Montaigne (Presenting author)
Co-Author: Dr Sabatini, Benjamin - Massachusetts Institute of Technology
Keywords: Archaeometallurgy, publication strategy
Presentation Preference: Oral

Archaeometallurgy comprises the study of production and usage of metals in prehistory and history. The natural sciences have contributed much to the field of archaeometallurgy, which generally includes aspects of archaeology, metallurgy, material science, chemistry, and geology. Archaeologists occasionally work with scientists from these fields, but does this then make them all archaeometallurgists, or outsiders who merely contribute to the field of archaeometallurgy on occasion?
While fruitful interdisciplinary cooperation is growing, the publication of the results of such cooperation is typically the responsibility of the archaeologist. This constitutes a problem for young researchers in science, since archaeological journals, books, or conference proceedings are usually not found in Scopus or the web of science (WOS). The options

for publication of archaeology related studies do not have compelling impact factors (IF), if a value is given at all. Examples of relatively well known journals for archaeometallurgical studies are: Archaeometry, Journal of Archaeological Science (new: their Reports), and Archaeological and Anthropological Sciences and even these journals have low IF's. The unattractiveness of low IF journals often leads to double publications of the results by participating archaeologists and scientists – one scientific publication and one longer, 'light' version for archaeology. The publication decorum on both sides is also often unattractive to authors and interpreted differently across fields. Order of authors, measurements of the journal's 'quality', and speed of publication differ significantly.
As a result, archaeologists rarely publish in journals dedicated only to metallurgy, material science, chemistry, or similar, claiming the low visibility of such publications in the field of humanities and social science. On the other side, purely archaeological journals often refuse archaeometallurgical manuscripts as 'too scientific.'
We will present different publication strategies to improve both the visibility of archaeometallurgy in science journals and the attractiveness of archaeological publication media for natural scientists.

06 THE ROYAL TOMBS OF UR: INTERDISCIPLINARY RESEARCH ON MATERIAL ANALYSIS OF EARLY BRONZE AGE COPPER-, BRONZE AND SILVER ARTEFACTS

Author: PhD. Student Salzmann, Eveline - Goethe-University Frankfurt (Presenting author)
Co-Author: Prof. Dr, Klein, Sabine - Deutsches Bergbau-Museum Bochum; Prof. Dr. Hauptmann, Andreas - Deutsches Bergbau-Museum Bochum
Keywords: Copper, Silver, Provenance
Presentation Preference: Oral

The excavations of the Royal Tombs of Ur (1922-1934) [Woolley 1934], dated to the Early Dynastic period (mid to late 3rd millennium BC [Helwing 2014, Pollock 1985]) bestowed large amounts of metal finds. Besides prominent gold objects, plenty of arsenical copper high in nickel, tin bronze and silver objects were found. The great number of metal objects surprised, because Ur is located in the flood area of Euphrat and Tigris and is void of metal resources. This geological fact indicates an import of metals [Zettler & Horne 1998].

The Penn Museum, Philadelphia, provided more than 100 artefacts of silver, copper and bronze for analytical investigations. The samples were investigated at the laboratories of Frankfurt and Bochum regarding the analysis of major and trace elements with geochemical methods as well as lead and copper isotopes.

The main goals of this project are: 1.) Identification of natural and artificial alloys and 2.) Origin of the metals and ores used for making the artefacts. The Royal Tombs of Ur were buried in the "Age of Exchange" [Amiet 1986] when metal production boomed in widely spread regions, which all have to be taken into consideration as possible sources. The scientific investigations are accompanied by a close cooperation with Assyriologists and Archaeologists to consider not only the scientific but also the archaeological and textual evidence. Our results contribute to a better understanding of trade and exchange in the Early Bronze Age Middle East within the different disciplines.

07 BRIDGING TYPOLOGY AND ANALYTICAL METHODS: A WEAR ANALYSIS OF EARLY PREHISTORIC METALWORK IN ITALY

Author: Dr Iaia, Cristiano - Newcastle University (Presenting author)
Keywords: Use-wear, Typology, Metalwork
Presentation Preference: Oral

Typologies of copper-base metalwork have been one of the dominant preoccupations of traditional prehistoric scholarship. In the last decades, they have lost most of their centrality vis-a-vis other interpretive threads and faced a difficult integration with the analytical methods of archaeometallurgy. In this paper, the author suggests that, even though typologies are a necessary tool for recognizing similarities across space and time the way they are constructed conveys a static, unchanging image of individual metal objects that clashes with the evident nature of them as cumulative archives of complex 'life-histories'. A method that can unlock these histories is Wear analysis, a microscopy-enhanced technique, long established in lithic studies, which is beginning now to develop its own rigorous protocol for metalwork, in close conjunction with experimental archaeology. Drawing on this assumption, a sample of over 100 Italian artefacts dating to the Late Neolithic and Copper Age (4500-2000 BC) has been examined by Wear Analysis within the Horizon 2020 funded research TEMPI, hosted at Newcastle University. The observations have revealed that axe-heads and daggers/halberds are the final palimpsests of manifold technical acts, mainly centred on the mechanical alteration of the original casts, from forging to polishing, re-sharpening and wear. This microscopic evidence, combined with a new morphometric sorting, might constitute a contribution towards a reflexive classification of early metalwork in Italy which takes into account the mentioned changeable nature of artefacts.

08 TYPE, SHAPE AND COMPOSITION OF MIDDLE BRONZE II DAGGERS IN THE SOUTHERN LEVANT.

Author: Dr. Kan-Cipor- Meron, Tal - The University of Haifa, Israel (Presenting author)
Keywords: Archaeometallurgy, Trade, Levant
Presentation Preference: Oral

Hundreds of copper-based weapons from the Middle Bronze Age II (MB II; c. BCE- c. 1900-1600 B.C.E.) have been unearthed, mostly from burials, all over the Levant. In contrast to the usage of copper and arsenic copper for production of weapons in the Early Bronze Age, and the mass usage of tin bronze for Late Bronze Age weapons, during the MBII period weapons were produced using both bronze tin and arsenic copper. Until now no clear correspondence between the alloys used and the MBII types, chronological sequence or regional distribution was found.
In the present research, by using "higher resolution" correlation between shape (typology) of daggers, and their metal composition (metallurgy) we try to "zoom in" by examining such relations and differences in one, relatively large group of 65 MBII daggers from a single vast MBII cemetery in Rishon LeZion, on the Mediterranean coast of Israel.
The results of this research show that in the beginning of the MBIIA period and during the transition to the MBIIB period, most of the decorated daggers were made of tin bronze, while during the transition from the MBIIA - MBIIB period and in the MBIIB period undecorated daggers more common and contain alloys of tin bronze, arsenic copper and copper with tin and arsenic. This metallurgical change may reflect the metalsmiths' reliance on the availability of the raw materials, which, when not in abundance, encouraged the creation of metal alloys from recycled metals from earlier periods.
These results can be related to changes trade systems of the MBII. These trade routes through land and sea connected Mesopotamia with Anatolian and Syrian-Lebanon and the Southern Levant in the MBIIA were not operational due to political and economic changes, as the establishment of the Hyksos control centers in the Southern Levant in the MBIIB period.

09 INSIGHT INTO THE SOURCING, PRODUCTION AND LIFE HISTORIES OF BRONZE IN LATE IRON AGE CENTRAL EUROPE

Author: Dr. Danielisova, Alzbeta - Institute of Archaeology CAS (Presenting author)
Co-Author: Prof Mihaljevic, Martin - Institute of geochemistry mineralogy and mineral resources, Faculty of natural sciences, Charles University, Prague
Keywords: bronze-provenancing, Iron-Age, geochemistry
Presentation Preference: Oral

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 specific 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 network.
However, we have yet to find out in what form the copper or its alloys were handled. There is no evidence among – now quite abundant – material assemblages how the copper was exploited or economically treated. There is only evidence of very intensive and well organised local bronze production that took off in second half of the 3rd century BC with the emergence of the first agglomerations in the middle Danube area.
Because of the results from our analysis of the variety of bronze objects from the oppidum of Třísov (trace-elements, Pb and Cu isotopes), we currently have a reason to doubt the local provenance of material used for their production. Now the working hypothesis is that because of the abundancy of material already in circulation (reflected in the assemblages of the oppida), and also due to established long distance contacts, there was not an extensive need for local exploitation. However, the question of provenance remains difficult. The Iron Age represents advanced economy with widespread reuse and recycling of valuable materials making the issue much more complex. In this case we should turn our attention towards the production-mechanisms of bronze, in what form the material potentially travelled, its use and reuse and in a broader sense also the way of appropriation of resources, the nature of long-distance contacts and socio-economic strategies of the late Iron Age communities in central Europe.

10 NEW LIGHT ON ROMAN LEAD (SILVER) MINING WITH LEAD ISOTOPE ANALYSIS

Author: Dr. Bode, Michael - Deutsches Bergbau-Museum Bochum (Presenting author)
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Keywords: Roman, lead, lead-isotopes
Presentation Preference: Oral

Lead ore mining was an important economic activity in various regions of the Roman World like the Iberian peninsula, Britain, Sardinia, Germany or the Danube region, documented by archaeological evidence, ancient authors, inscriptions and coins, and especially by nearly 3000 lead ingots. These ingots were in the focus of an interdisciplinary project (founded by the German Research Society) combining lead isotope and chemical analyses with archaeology and particularly epigraphy. With the priority for lead isotopes, this paper wants to show some new results about the economy structure in Iberia, the Balkans and also likes to direct attention onto a mining region which so far was not in the focus for lead (silver) export.

11 PATTERN WELDED AND INSCRIPTED SWORDS: A MULTIDISCIPLINARY PERSPECTIVE ON EARLY MEDIEVAL ARMS PRODUCTION AND DISTRIBUTION IN THE EASTERN BALTIC.

Author: Dr. Tomsons, Arturs - Latvian National History museum (Presenting author)
Keywords: Pattern-welding, metallurgy, swords
Presentation Preference: Oral

Pattern welded and inscripted swords form a significant part of archaeological collections of three Baltic States: Latvia, Lithuania and Estonia. In this region during the Late Iron Age and Medieval period swords are valuable archaeological source, as they often are part of the burial customs. Analyze of these weapons in proper context allows acquire information about metallurgy, certain workshops, social relations, political geography, trade routes, military conflicts and battle sites, spiritual beliefs etc.

During the study more than hundred swords were re-examined from different perspectives and newly acquired data add significant addition to mapping the distribution of these weapons in the North-East Europe during the Viking Age and Medieval period.

During the research several new pattern welded and inscripted items were discovered and analyze of written sources allowed identifying additional information about possible evidence of use of pattern welded and inscripted blades even in traditional folklore, which is thought to be several centuries later.

12 INTEGRATING EXCAVATION, EXPERIMENT AND ANALYSIS INTO THE STUDY OF ANCIENT EGYPTIAN METALLURGY: THE EACOM PROJECT APPROACH

Author: Doctor Frederik, Rademakers - KU Leuven - Departement of geology; EACOM - archaeometallurgyCurator Egyptian collections Luc, Delvaux - Royal Museums of Art and History Brussels
Co-Author: Researcher in archaeometallurgy Georges, Verly - Royal Museums of Art and History Brussels; EACOM - archaeometallurgy (Presenting author); Professor Patrick, Degryse - KU Leuven - Departement of geology
Keywords: methodology, experimentation, archaeometallurgy
Presentation Preference: Oral

The EACOM project aims to illuminate early Egyptian metallurgy through an interdisciplinary approach that draws on multiple lines of archaeological evidence. This starts in the field, with ongoing excavations at the Middle Kingdom site of Ayn Soukhna, where extensive evidence for primary copper production is recovered. The production remains of this technology form the basis for extensive experimental reconstructions, to better understand the ancient furnace operation. Following a strict protocol, this involves testing various operating modes for the furnaces, with different fuels, ores and conditions, and comparing the resulting outcomes with the archaeological evidence. Apart from yielding operational data essential to understanding the ancient metallurgical process, the experiments illuminate possible gestures and steps in the chaîne opératoire, for which the ar-

chaeological stratigraphic evidence may be very subtle. These experiments thus feed back into the continued excavation, and have delivered important discoveries by expanding the excavator's perspective in their trench.
This approach is further integrated in an analytical programme, whereby "traditional" metallurgical analysis of both experimental and archaeological production remains is undertaken. Analyses of copper alloy artefacts from the RMAH museum collection are included here as well. On the one hand, this aims to expand the extremely limited database of Egyptian copper studies, as a means to document and understand changing alloys and their provenance. On the other hand, this immediately feeds back into improving reconstructions of ancient Egyptian metallurgical technology and refining the experimental approaches outlined above.
As such, results from analysis, experiment and excavation are constantly informing each other, allowing refinement of the methodology. The holistic contextual interpretation of these different lines of evidence thus aims to be readable and of interest to archaeologists from all traditions. In this paper, we present an overview of our methodology and highlight its broader implications for archaeological approaches to ancient metallurgy.

13 HOW DID TIN TRADE IN SOUTHEAST EUROPE WORK? CONSIDERATIONS ABOUT LONG DISTANCE NETWORKS AND RAW MATERIAL EXCHANGE

Author: Dr. Nessel, Bianka - Heidelberg University (Presenting author)
Co-Author: Dr. Brügmann, Gerhard - Curt-Engelhorn-Center for Archaeometry gGmbH; Prof. Dr. Pernicka, Ernst - Curt-Engelhorn-Center for Archaeometry gGmbH; Heidelberg University; Marahrens, Ms, Janeta - Curt-Engelhorn-Center for Archaeometry gGmbH
Keywords: isotopy, Europe, exchange
Presentation Preference: Oral

Recent research makes it is more and more likely that tin sources in western and central Europe supplied large parts of continental Europe with tin (Nessel et al. 2015). The presentation will focus on isotopic data of southeastern European bronzes from the end of the Early and beginning of the Middle Bronze Age. The sample set comprises bronzes from hoards, graves, and typologically well-dated single finds from southeastern European and Aegean bronzes from the first half of the 2nd millennium BC.
We will discuss the analytical determination of tin isotopic compositions and the possible use of tin from different ore sources, as well as the potential distribution of tin through exchange networks between the Carpathian Basin, the Aegeo-Balkan-Complex and tin bearing regions in Central and Western Europe. The presented analyses indicate a possible reorientation of exchange routes during the 2nd millennium BC. Since Analyses of Aegean bronzes from the beginning of the 2nd millennium BC show higher tin isotope ratios than the southeastern European sample set, different tin sources might have been used to manufacture these bronzes. This is a similar result as observed by Begemann et al. (1999) albeit with a different fractionation trend.
A combined approach of archaeological methods and tin isotopic data provides a glimpse of how and where trade networks were established and extended over a period of 500 years.

Begemann, F., Kallas, K., Schmitt-Strecker, S., Pernicka, E. 1999: Tracing ancient tin via isotope analysis. In: A. Hauptmann, E. Pernicka, T. Rehren, Ü. Yalçın (eds.): The Beginnings of Metallurgy. Der Anschnitt, Beiheft 8, Deutsches Bergbau-Museum, Bochum, pp. 277-284.

14 COLLABORATIVE CONTRIBUTIONS TO THE STUDY OF COPPER AND BRONZE IN THE CARPATHIAN BASIN

Author: Dr Kiss, Viktória - Institute of Archaeology HAS (Presenting author)
Co-Author: Prof Dr Pernicka, Ernst - Curt-Engelhorn-Zentrum Archäometrie gGmbH
Keywords: Bronze Age, Hungary
Presentation Preference: Oral

The appearance of bronze metallurgy fundamentally rearranged the socio-economic organization of the communities of the period across Europe. The new technology, know-how and raw materials led to the formation of new networks and increased inequality. Scholars usually suggest that the Carpathian Basin had a fundamental role in the spread of this new technology. The Momentum Mobility research group of the Hungarian Academy of Sciences aims to study the raw material supply and technological details of bronze metallurgy with the cooperation of archaeologists and specialist of material sciences. The presentation will discuss the research questions of Early and Middle Bronze Age copper and bronze finds based on recent raw material and lead isotope studies.

15 METALLURGICAL ACTIVITIES AT THE SAN TOMMASO CONVENT IN THE LATE MIDDLE AGES

Author: Dr Anguilano, Lorna - Brunel University London
Co-Author: Ms Marras, Laura - Universita' di Sassari (Presenting author); Ms Ungredda, Francesca - Universita' di Sassari; Dr Piredda, Giovanni - indipendent; Ms Saba, Cinzia - Universita' di Sassari; Dr Grassi, Elisa - Universita' Cattolica di Milano; Dr Sipala, Valeria - Università di Sassari; Prof Mulas, Gabriele - Univrsità di Sassari
Keywords: cuppellation, brass, crucibles
Presentation Preference: Poster

In this paper a number of metallic and ceramic samples are presented. The samples were recovered during a rescue archaeological investigation at the Convent of San Tommaso in Pavia, and were investigated by a group of archaeologists, chemists and archaeometallurgists to evaluate the data from different perspectives. The area was already used during roman imperial time and located close to the ancient city wall. A number of chemical and petrographic analysis were performed on the samples and testify metallurgical activities from late Middle Ages. The data indicate two major processes related to recovery of silver from brasses through the cuppellation method and brasses remelting. Few evidences of the presence of copper minerals were also ascertained.

343 PUTTING SEAFARING ON THE MAP: THE APPLICATION OF COMPUTER MODELS TO MARITIME SPACES AND COMMUNICATION NETWORKS

Theme: 5. Comparing Archaeology Across Regions and Periods
Author:
Co-Author(s): Slayton, Emma (Netherlands) - University of LeidenSafadi, Crystal (United Kingdom) - University of Southampton, Centre for Maritime Archaeology
Keywords: Maritime Archaeology, Seascapes, Navigation, GIS
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Movement on water has long marked our human story. Yet the very challenging environment of seas, oceans, and water bodies makes the study of those movements and corresponding activities difficult to examine. As such, there has sometimes been a disconnect between our land derived archaeological knowledge and how to it corresponds to maritime movements, activities, networks, and seafaring communities . This however, is no longer the case, as new models and underwater excavation techniques are developed and introduced to the study of maritime environments and movement through water on a global level. These methods help elucidate the processes underlying sea-related activities, and the costs inherent in undertaking sea voyages. Understanding these processes is crucial, as archaeologists can then shed light on social issues tied to sea travel and activities, which have long been obscured by the difficulty of the study area. The aim of this session is to provide a space where regional examples can be explored and compared, and to generate a discussion amongst researchers on the different ways of investigating issues associated with maritime space and navigation in the past. This session welcomes papers which discuss the origin of seafaring, the development of navigation styles and processes, the use and adaption of sailing techniques in different environments, as well as the advancement of computer models and digital means to explore maritime issues. This can also refer to papers that are expanding on previous research or developing innovative methods to tackle past maritime spaces.

01 EVALUATING LEAST COST CANOE ROUTES FROM THE CARIBBEAN

Author: Ms Slayton, Emma - Leiden Univesity (Presenting author)
Co-Author: Mr. Athenstädt, Jan - University of Konstanz; Prof. Dr. Hofman, Corinne - Leiden University
Keywords: GIS, Seascapes, Seafaring
Presentation Preference: Oral

Inter-island networks have long been a source of interest among Caribbean archaeologists. This interest has taken the form of in-depth archaeological and network analyses, and even some forays into determining the practicalities of maintaining island-to-island links. However, more research needs to be done to consider the physical reality Amerindian canoe trips that facilitated these connections. This includes an evaluation of the layout and cost associated with these canoe routes.
Least-cost pathway analysis is most often applied in land-based contexts, but over the past several years has begun to be applied to sea-based travel. In the context of the Caribbean, one of the authors has focused on using this type of analysis to evaluate how separate island groupings, with different geographical placement and surrounding environment, could have been connected. Comparing canoe routes between the Greater Antilles and the Leeward Islands of the Caribbean during the Late Ceramic Age (AD 1200 -1500) are a good start, as the archaeology found in the islands supports the existence of long distance exchange between them. One focused on pathways between a relatively close and clustered layout of the Leeward Islands. The other deals with exchange across strong currents and the visual break between the Greater and Lesser Antilles.
The pathways for this case are held against the seasonal ins and outs of island networks, as judged through a least cost pathway isochrone model. In part this is due to the anisotropic nature of the reciprocal voyages, or routes modeled to and from island sites, which allow us to look for possible annual cycles of movement through several locations. The resulting model of these connections will be compared to determine how a change in location and environment can affect sea-based least cost pathway modeling with an isochrone based method.

02 NETWORKING WIND IN MARITIME EXCHANGE

Author: Prof Rivers, Raymond - Imperial College London (Presenting author)
Co-Author: Dr Evans, Tim - Imperial College London; Prof Knappett, Carl - University of Toronto
Keywords: networks, wind, Aegean
Presentation Preference: Oral

With the help of GIS and wind and current charts it has been possible to make first steps in modelling historic maritime exchange, particularly in providing a 'least-cost' analysis of exchange links between coastal sites. See, for example, the extensive analysis of the Roman Mediterranean by ORBIS. However, a map of links is not a network, however quantitative each link may be, in that the removal of any single link would not, a priori, affect the others. Our understanding of networks is that the whole is greater than the sum of the parts; the change of a single link affects links which are not even directly connected to the one changed, even if costs remain unaltered. Our expectation is that intentional networking 'improves' the functioning of exchange.
This is particularly important if negotiating unfavourable weather is problematic. This is not just the case of avoiding open-sea travelling in the storm season but that, even in the sailing season, winds can be adverse with only intermittent relief. This is the case for Aegean Middle Bronze Age 'Minoanisation', in which the states of N Crete extend their influence north despite prevailing northerly winds. When constructing networks, averaging wind speeds is not a solution since the prevailing sailing technology is only just capable of making key journeys in the intermittent favourable winds. Nor is just counting the frequency with which favourable winds arise.
In this talk we discuss how networking can improve maritime exchange in unfavourable winds. For demonstration we take an idealised Aegean archipelago, chosen for its simplicity rather than historic relevance, but this is sufficient to enable us to make useful inferences for the MBA S Aegean at large (see Rivers, Evans & Knappett, to be published in "Advances in Shipping Data Analysis and Modelling", ed. C. Ducruet, Routledge, 2017)

03 HUMAN SEASCAPES AND RITUAL ACTION: MODELING THE MARITIME MOBILITIES OF THE GREAT GODS OF SAMOTHRACE

Author: Mr. Bryant, Robert - University of Pennsylvana
Co-Author: Dr. Blakely, Sandra - Emory University (Presenting author)
Keywords: mobility, ritual, maritime
Presentation Preference: Oral

The maritime promises of the mystery cult of the Great Gods of Samothrace were the least secret aspect of a famously well-kept mystery cult. From the sixth century BC to the fourth century CE, the island's gods were the recognized masters of maritime safety, and initiates into their mysteries the beneficiaries. These promises have been the least expored question in the investigative history of the cult. The lacuna reflects, in part, the absence of well defined, archaeologically rigorous methodologies for exploring ancient maritime mobility. Samothrace offers a case study for the potential of digital technologies in exploring ancient mobility. We begin with the hypothesis that the cult worked: its initiates sailed a safer sea than other travelers. During the densely networked, politically volatile Hellenistic period, the island was one of the most active dispensers of proxenia, a civic honor which lowered port taxes, enabled communication, and assured non-aggression. These inscriptions have formed the basis of our Samothracian database, whose geospatial (ArcGIS) and human social network (GEPHI) reach we have analyzed, and brought together for study using Django. Our analyses suggest a sparse, scale-free network, resilient to interruption, and capable of supporting a Monte Carlo analysis to reveal a model of the cult's emergence as a bottom-up phenomenon, the organic collusion of multiple smaller regional networks. Our most recent venture is the gamification of our data in a Unity development platform. The project lets us approach the question of agency through choices made by contemporary players, operating in a simulated environment attentive to the material factors of wind, current, celestial guidance and topographic markers, and to the anthropogenic factors of mythic narrative, local resources, and the human social networks which would help sailors determine the routes and ports most calculated to serve their interests.

04 THE EXPLOITATION OF OCEANOGRAPHIC AND TIDAL CURRENTS BY EARLY SEAFARERS, MIGRATING TO AUSTRALASIA AROUND 50,000 YEARS AGO

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Keywords: seafaring, oceanography, migration
Presentation Preference: Oral

Australasia was colonised by modern humans around 50,000 years ago. At this time, global mean sea level was around 70–80 m lower than at present, exposing parts of the continental shelfs around Southeast Asia and Australasia. Nonetheless, vast bodies of open water had to be crossed by early seafarers to reach the continent. Despite the significance of this event in the deep human past, the nature of the colonisation process is still poorly understood. Debate centres on whether it entailed deliberate seafaring or unintentional drift, and what this can imply about past human behaviour. To resolve this debate, it is crucial to understand how environmental factors, such as sea level change, the location of past coastlines, and ocean and tidal currents, affected movement over sea.
Here, dynamic effects of the maritime environment on seafaring are explored with computer models of open ocean and coastal tidal circulation. A particle-tracking algorithm is used to calculate large ensembles of simulated ocean drifts in a General Circulation Model. These are analysed to determine probable timescales and trajectories of movement through the study region, in present-day circumstances. In further experiments, depth levels are lowered to explore changes in drifts at different sea levels, specified for time-slices relevant to the colonisation of Australasia. In addition, changes in tidal currents at lower sea levels are investigated, using a hydrodynamic model of the Australian coastal region.
Preliminary findings emphasize the strong but variable influence of ocean and tidal currents on movement to Australasia. Familiarity with these currents would have been advantageous to early seafarers. This aspect of early human migration has not been previously investigated in such detail. Oceanographic insights thus provide new perspectives on an archaeological issue, demonstrating the value of multidisciplinary research in resolving current debates on ancient seafaring.

05 COMBINING LCP AND VISIBILITY MODELLING TO ASSESS THE PLACEMENT OF PROMONTORY FORTS ALONG THE IRON AGE COAST OF PEMBROKESHIRE, UK.

Author: Mr. Smith, Karl - University of Oxford (Presenting author)
Keywords: navigation, visibility, least-cost
Presentation Preference: Oral

This project demonstrates the potential of combining water-based least-cost path (LCP) modelling with visual analysis to examine perspectives relevant to specific archaeological questions. In this project, a least-cost path model and visibility analysis were combined into a diachronic model in order to address the location of promontory forts in Pembrokeshire during the British Iron Age (1000 BC – 100 AD). Scholars assume that during this period voyagers were travelling along a corridor from Asturias in Spain to the Shetland Islands in the UK – an area that has been described as an 'Atlantic Zone' or 'Atlantic Façade'. Although narratives for this region stress the role of waterways in facilitating contact, trade and communication, few analyses have approached the Atlantic Façade from a mariner's perspective. This project achieves a sea-based perspective by using least-cost paths representing voyages along the coast of Pembrokeshire to derive sets of isochoric observer points for a 3D visibility-analysis technique developed specifically for this analysis. This technique generates projective arrays for each observer point, and intersects those arrays with 3D surfaces representing the coastline and the forts themselves. This analysis suggests that a specific type of promontory fort appears regularly to a voyager moving up the coast, and may have functioned as sea-marks or trading sites. This paper discusses the results of this case study, and ways in which the techniques used here can be developed to understand other aspects of visibility and movement, and to further studies of the Iron Age Atlantic Façade.

06 USING WIND FETCH AS A PROXY FOR THE IDENTIFICATION OF HARBOUR SITES

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Keywords: oceanography, harbours, GIS
Presentation Preference: Oral

One of the main functions of harbours is to provide shelter against wind and waves. The vulnerability of a harbour to the wind climate and waves depends on climate conditions and the surrounding landscape. Wave conditions in turn are mainly dependent on wind speed, direction and fetch. The fetch can be defined as the distance the wind travels over open water. It is an important parameter for wave-height modelling and as such for the quality of a harbour or landing site.
In this paper we would like to introduce the fetch method, a simple tool to estimate the wave climate at a certain place along the coast. While wind fetch is a well-known variable in coastal erosion models, it can also be used to predict the quality of certain areas along the coast as harbours, anchorages or landing sites.
As part of a large research programme on Roman and medieval harbours in Europe funded by the German science fund DFG, the international research project "Harbours in the North Atlantic AD 800-1300 (HaNoA)" focuses on Norse harbours and landing sites in areas settled by the Norse across the North Atlantic, namely the western part of Norway, Shetland, the Faroe Islands, Iceland and Greenland. These areas have similar topographies and climate conditions and had a dispersed settlement structure in the Norse period. The harbours consisted mostly of simple landing places without any permanent harbour infrastructure. Despite the obvious importance of harbours for the island communities, they have hitherto not been studied systematically by archaeologists due to their elusiveness. Based on case studies from the HaNoA project we will show how the fetch method can be used to identify potential harbours and anchorages on a regional level as well as to evaluate the quality of different landing-places on a local scale.

07 FAMILY NETWORKS – THE ADRIATIC COMMUNICATION AREA IN A GIS

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Keywords: Harbours, GIS, Networks
Presentation Preference: Oral

In the year AD 9, Emperor Augustus accomplished the conquest of Dalmatia. Since then, the route for many Roman merchants was open to new markets and resources. The connection to the inner regions of Dalmatia were difficult to reach due to the Dinaric Alpes that function as a natural barrier between the littoral and the hinterland. In front of the coast hundreds of islands provide natural landing places and bays, and many of them were inhabited. Seafaring was the most important means of transportation and travel in this area – and thus the ports were of high importance, too.

The DFG SPP 1630 project "Adriatic Communication Area" compares networks of attested Roman familiae with regard to the development of the harbours in the central and northern Adriatic Sea. Some of these wealthy familiae hold different and prominent political positions. In a GIS these familiae were mapped to show the settlement pattern since Augustus' conquest of Dalmatia. The primary port due to the Roman migration was Salona. From here members of different familiae spread out to the northern and southern part of the Dalmatian coast and later on also into the hinterland. The preliminary results in the GIS show ports and harbours in Dalmatia of common interests and reflect their role in the process of migration and Romanisation of the Dalmatian area in the 1st and 2nd century AD.

08 MAPPING BRONZE AGE MARITIME SPACE AND TIME OF THE LEVANT

Author: Miss Safadi, Crystal - University of Southampton (Presenting author)
Keywords: Maritime, space, Levant
Presentation Preference: Oral

Maritime spaces benefit from natural characteristics and rhythms that act above and beneath the water surface. These spaces foster a home for the movement of wind, water, ships and people. Yet, they are not present in isolation. Land and sea seamlessly merge shaping waterfronts that are marked by human activities. These coastlines and their archaeological record are paramount for unravelling processes of human engagement with the sea. Our knowledge of maritime spaces is growing, yet much of their affordances remain concealed. By reconstructing and analysing models of spatial and social processes, we can reach a better understanding of lived maritime spaces.

The Early Bronze Age (EBA) (c. 3600-2000 BC) in the Levant conventionally marks the first urban period. The Levantine littoral played a major role during the mid-third millennium, when maritime connections, particularly with Egypt, became vital. Although archaeological narratives have attempted to explain maritime affairs and social complexity of the EBA Levant, most did not appraise the role of maritime activities and spaces, nor re-institute that region in its sea and land, land and sea narrative.

This paper aims to study and analyse the coastal Levant during the EBA as a relational maritime space grounded in activities on land and on water. It builds on a rhythmical and a time-space analysis of the performance of seafaring in the Levantine basin, and of the EBA maritime archaeological record of the area, in order to move beyond generic events to social processes, and shift from a representation of space as a container towards social relational space.

344 DECONSTRUCTING EUROCENTRISM, BUILDING BRIDGES

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author(s): Parthesius, Robert (Netherlands) - Centre for International Heritage Activities; Leiden University; New York University Abu DhabiYalman, Nurcan (Turkey) - Centre for International Heritage Activities; Cultural Awareness Foundation Istanbul TurkeyRosetti, Ilaria (Netherlands)
Contributor: Munawar, Nour (Netherlands) - University of Amsterdam; Veer, Vera Veer - Leiden University; Rasselkopf Bonneken Kathrin - Leiden University
Keywords: Eurocentrism, Cultural Heritage, Community Engagement
Presentation Preference: Round table

Eurocentric heritage philosophies stand at the centre of a long and critical discourse that is adamant in challenging the changing nature of heritage management in today's globalised world.
With the very 'chartering' of heritage by global bodies like UNESCO and ICCROM, a 'Euro-HeritageSpeak' has integrated itself into national legislations worldwide. This is especially

visible with nations that maintain ties with their former colonial powers in embracing their mutual cultural heritage. When mismanaged, however, the dominant Eurocentric model regularly finds itself as the primary determinant for criteria, statues and sanctions in these countries. This thus poses a great challenge for a local-level interaction with the past and a grassroots willingness for custodianship of heritage sites. Numerous questions arise concerning community engagement or where the nexus of global and local - or 'glocal' - initiatives meet.
As such, there is a need for new modes of representation where authority is shifted towards community-based platforms that evoke alternative senses of belonging and recognition. The ongoing projects of CIE- Centre for International Heritage Activities (Leiden) including its online knowledge platform the Heritage Emporium and its field schools at Robben Island, South Africa will be presented as a conceptualisation of these needs. Both projects advocate alternative ways of visualising and studying local and official national narratives and call for a profound reconfiguration of current heritage management. By introducing these projects collaborative with NYUAD and other colleagues' different understandings of this subject a dialogue will be opened in an effort to propose sustainable heritage protection applications.

345 DIGITAL RECORDING OF PREHISTORIC ROCK-ART: HOW CAN NEW TECHNOLOGIES HELP US TO UNDERSTAND, MANAGE, PRESENT AND PRESERVE PREHISTORIC ROCK-ART SITES?

Theme: 6. Interpreting the archaeological record
Author: Brophy, Kenneth (United Kingdom) - University of Glasgow
Co-Author(s): Saumarez Smith, Ferdinand (Spain) - Factum Foundation / Factum Arte
Keywords: Rock-art, digital recording, laser scanning
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Digital, laser scanning and photogrammetric recording technologies offer huge potential for documentation, management, interpretation and public engagement with prehistoric rock-art across Europe. The creation of high resolution datasets associated with rock-art offers potential to greatly enhance our understanding of these sites, from new insights into the motifs and extent of rock-art, to a greater appreciation of the methods used to carve or paint symbols onto rock. There is huge potential for the use of such data for the creation of replicas, establishment of public engagement and citizen science projects, and emergence of better informed management and preservation strategies of what is often a fragile, poorly understood resource.
The recent recording of the Cochno Stone, Scotland, UK, shows the potential of such approaches. One of the most extensive panels of Neolithic rock-art in northern Europe, this site was buried in 1965 to protect it from vandalism. Laser scanning, aerial and ground-based photogrammetry combined to create a powerful and exciting dataset. As well as allowing detailed analysis and interpretation of prehistoric and antiquarian markings, the data will be used for the creation of a huge 1:1 scale facsimile, facilitating continued preservation of the original stone while opening up this site as a visitor attraction and research focus.
In the spirit of sharing experiences and good practice, contributions to this session are invited from projects across Europe utilising digital, photogrammetric and /or laser scanning technologies to explore the huge potential these have for understanding, management, presentation and preservation of prehistoric rock-art sites.

346 WITHIN THE WOODLANDS: EXPLOITATION OF WILD PLANTS DURING THE MEDIEVAL AND POST-MEDIEVAL PERIOD

Theme: 6. Interpreting the archaeological record
Author: Martín-Seijo, María (Spain) - Universidade de Santiago de Compostela
Co-Author(s): Deforce, Koen (Belgium) - Flanders Heritage Agency; Royal Belgian Institute of Natural SciencesParadis-Grenouillet, Sandrine (Italy) - Università degli studi di PadovaTereso, João (Portugal) - InBIO- Research Network in Biodiversity and Evolutionary Biology; CIBIO - Research Center In Biodiversity and Genetic Resources/University of PortoWiethold, Julian (France) - Inrap
Keywords: Wild plants, Archaeology, Archaeobotany, History,
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Wild plant resources were crucial for past communities, even during Medieval and Post-Medieval period. Woodlands had an important role in the day-to-day life of these communities providing wood, charcoal, mushrooms, moss, fibers, resins, tars, fruits, nuts, berries, animal fodder, etc.
This session will focus on wild plant resources, defining their importance in recent periods through interdisciplinary approaches including archaeology, archaeobotany and analysis of historical sources. Until now, the study of medieval and post medieval woodland exploitation has mainly focused on timber and fuelwood supply and charcoal production. Woodland exploitation for other plant resources is far less known. This session wants to fill this research gap focusing on the importance of these landscapes in the medieval and post medieval economy, including also other themes associated to these resources such as trade, exchange, cultural practices, identity, etc.

01 WOODCRAFTS AND PLANT REMAINS TO TRACE THE HISTORY OF PONTEVEDRA'S HARBOUR (NORTHWEST SPAIN) BETWEEN 14TH AND 18TH CENTURIES AD

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Keywords: Harbour, Archaeobotany, Waterlogging,
Presentation Preference: Oral

The Galician coast (Northwest Spain) is irregular and contains several estuaries that form natural ports (Solórzano 2009). Pontevedra's harbour is placed at a natural shelter in the Lérez river mouth, a place with defensive advantages and protection from the wind. Pontevedra had a commercial wharf, Peirao da Ponte, built in 1339 located inside the town,

and a fishermen's wharf in A Moureira (Solórzano 2009). Recent archaeological surveys in the Lérez riverbank have provided new evidences about the Peirao da Ponte and its surroundings, besides material evidences of trade and economic activities.

The last archaeological field survey performed between 2014 and 2016 unearthed a complex archaeological assemblage including perishable materials preserved by water-logging. The archaeobotanical remains comprised woodcrafts –personal objects, basketry elements, planks, and other architectural wood remains-, fruits, seeds, leafs, etc. The strategy of recovery combined handpicked samples in the case of woodcrafts and bulk samples -from stratigraphic units and columns-. Archaeobotanical research focused on waterlogged remains recovered from maritime archaeology is rather infrequent in Northwest Iberia.

Plant remains were mostly gathered from contexts dated to the 15th-16th centuries AD, despite samples from contexts dated to the 12th-18th centuries AD have been also analysed. This assemblage provides clues about day-to-day life in an urban context during Medieval and Post-Medieval period and even about sea lanes, trade routes and voyages –exotic objects such a cup made of a coconut shell has been identified-. The woodcraft assemblage considered in this study is heterogeneous and offers information about forest and landscape, wood species selection for carpentry and woodcrafting –mainly oak and chestnut-, the chaîne-opératoire of wood and highlights its importance as building material.

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02 WILD PLANTS USE IN RECIPES OF LATE MEDIEVAL AND EARLY MODERN COOKING BOOKS COMPARED TO THE ARCHAEOBOTANICAL EVIDENCE

Author: Dr. Wiethold, Julian - INRAP - National Institute for Preventive Archaeological Research; UMR 6298 ArTeHiS (Presenting author)
Keywords: medieval, recipes, archaeobotany
Presentation Preference: Oral

During the Middle Ages and early modern times wild plants have widely been used as complements to human diet. The late medieval and early modern cooking books are giving evidence of the use of different wild fruits (f.e. strawberries, blueberries, raspberries, blackberries...) and how they were used and prepared. In contrast to early herbals, which are mainly focusing on medicinal aspects, these early cooking books are strictly indicating wild plants used for human consumption.
The aim of the presentation is to discuss written sources concerning late medieval and early modern recipes and to evaluate the occurrence and status of wild fruits in human diet. Some of these books were written as manuals for teaching young apprentices, trying to be most complete by presenting recipes of even rare and extraordinary dishes.
In contrast to the written sources archaeobotanical data from cesspits, wells and rubbish layers are often limited to the presence of wild plants, but in most cases they do not indicate food preparation and wild plant use in detail. Concerning archaeobotanical studies of wells and cesspits it remains difficult to decide, if the plant macrofossils are deriving from faeces or from kitchen waste or from both sources. Some examples of archaeobotanical analysis of rubbish from kitchen waste and food preparation give some additional information concerning the the use of wild plants in human diet.
Nevertheless, local and regional trade of wild plants used must be assumed, but this commercial activity is most difficult to trace by written sources and archaeobotanical analysis.

03 FIREWOOD AND WOOD USES IN NORTHEAST OF IBERIAN PENINSULA DURING LATE ANTIQUITY AND MIDDLE AGES

Author: Dr. Piqué, Raquel - Universitat Autònoma de Barcelona (Presenting author)
Keywords: Firewood, Charcoal, Iberia
Presentation Preference: Oral

The charcoal data published in Northeast of Iberian Peninsula for Late Antiquity and Middle Ages is significantly low despite the increase of research on archaeological sites of this period during the last decades. Although the amount of grey literature (scientific reports) has increased this has not be translated into a better knowledge of firewood and forest uses. The aim of this presentation is to make a synthesis of both published and unpublished data in order to understand how forest exploitations was organized between late antiquity and modern times. The data covers different contexts of use: urban, small villages and rural; moreover spaces of firewood consumption and production of charcoal are compared with the aim to provide an approach to how wood exploitation was organized.

04 CONSTRUCTION AND FUEL: APPROACHES TO WOOD EXPLOITATION DURING MEDIEVAL TIMES IN CENTRAL-NORTHERN PORTUGAL

Author: Oliveira, Cláudia - CIBIO-InBIO/University of Porto (Presenting author)
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Keywords: Middle Ages, Anthracology
Presentation Preference: Oral

Recent archaeobotanical studies in medieval sites from Central Portugal provided relevant data on the use of wood as construction material and fuel. Archaeological levels with clear signs of destruction by fire are documented in several sites dated to the 9th-10th centuries. Such fires allowed the preservation of a wide set of evidences of daily activities and structures. In this paper we present unpublished data from Senhora do Barrocal and São Gens. These are also integrated in data already published from the coeval sites of Penedo dos Mouros, Soida and São Gens. Overall, these charcoal analyses revealed different types of building structures, such as palisades and huts, as well as wood used for fuel in hearths. Predominant species derive from the local deciduous oak forests. Other species are also present, including Castanea sativa, which was likely already being cultivated in the area during medieval times. We argue that paleoecological data is difficult to retrieve from the available anthracological evidence since samples derived from wooden building structures are preponderant. However, paleoecological approaches are possible given the palynological sequences obtained in montane lakes at the Estrela mountain range.

05 PIETY AND WOOD: AN ARCHAEOLOGY OF THE ROSARY

Author: Berthon, Amélie - Eveha; UMR 5138, ARAR, MSH MOM, Université Lyon 2
Co-Author: Dr Bellavia, Valentina - Eveha; UMR 6042, Geolab, Université Clermont Auvergne (Presenting author)
Keywords: Rosary, wooden artefacts
Presentation Preference: Poster

The Catholic rosary - the material testimony of piety – has a wide spatial distribution beginning during the 15th century. A materially composite and complex object often made of bone, metal and glass, wood held an important place in their manufacture, despite its fragility and relatively poor preservation within archaeological contexts. Wood may also be considered a less noble material, at least when compared to bone metal and glass; but as used in these highly charged religious objects, this still the case? While it is possible to determine that the pearls and crucifixes are made of wood, determining the species of wood used for these elements is not yet practiced. Our questions are, therefore, to determine if the same species of wood was used throughout a rosary (for the pearls and crucifixes)? Was the material used to make the pearls and crucifixes dependent on the environment (opportunism), or was a market logic followed, whereby mass-produced accessories were mounted on demand? In order to answer these questions, we take a pluri-disciplinary approach in studying these these objects, where the xylologist and small-finds specialist work together "dissecting" the history of object. Our data comes from a series of modern and contemporary French cemeteries, and allows us to converge paleoenvironmental and material analysis into an understanding of a common object that remains relatively unknown in its archaeological form.

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06 SETTING THE HEATH ON FIRE. FUEL USE IN TWO MEDIEVAL BRICK KILNS FROM FLANDERS (N-BELGIUM).

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Keywords: heathland, fuel, brick-kiln
Presentation Preference: Poster

The analysis of charred botanical remains (wood charcoal, seeds, fruits) from two late 15th/early 16th century brick kilns from Maldegem (Flanders, N-Belgium) shows that the shrubby vegetation, i.e. twigs from bog myrtle (Myrica gale), common heather (Calluna vulgaris), alder buckthorn (Frangula alnus) and birch (Betula sp.) from the local heathland vegetation was exploited for fuel to fire these kilns.
Today, heathland hardly occurs in the region anymore because of reforestation during the 18th and 19th centuries but it is known from historic documents that extensive heathlands dominated the landscape during the late and early post-medieval period. Recently, several landscape management projects were set up aiming to reconstruct this former heathland vegetation which is believed to have a much higher biodiversity potential compared to the planted forests. Little is known however of the woody vegetation of these heathlands and its exploitation by the past population. The analysis of the fuel remains from the brick kilns now provides detailed information on both the former composition and structure but also on the exploitation of this specific woodland type. It is the first time that the use of the shrubby vegetation from these heathlands for fuel can be demonstrated.

07 FUEL FROM MEDIAEVAL BELL-CASTING PITS: SOME EXAMPLES FROM PROVENCE (SOUTH-EASTERN FRANCE)

Author: Gillot, Isabelle - Université Côte d'Azur; CNRS; CEPAM
Co-Author: Vivas, Mathieu - LaScArBx; Université Bordeaux Montaigne; Henrion, Elise - Service départemental d'archéologie des Alpes de Haute-Provence; Aix-Marseille Université; Thuaudet, Olivier - Service de l'archéologie Nice Métropole; Université Aix-Marseille; Delhon, Claire - Université Côte d'Azur; CEPAM; CNRS (Presenting author)
Keywords: fuelwood, bell, Middle-Ages
Presentation Preference: Poster

Since the Middle Ages, bell founding requires wood and charcoal in at least two steps in the process: for drying and firing the clay moulds, then for smelting the metal (Neri, 2006). At that time, bells were manufactured by itinerant bell-founders in pits inside or near the church for which they were intended (Gonon, 2002).

Since the first work initiated in Nice (Gillot et al., 2014) and extended to four others sites (Gillot et al., upcoming paper), our aim is to analyse the charcoal remains in bell pits of various sites in south-eastern France in order to compare the wood used in bell manufacturing to get some informations on the origin of the wood used for making bells, technical aspect of casting mediaeval bells and bell-founders practices.

Our last work concern the Saint-John chapel in Moustiers-Sainte-Marie (Vivas & Henrion, 2016) and the old cathedral Notre-Dame du Bourg in Digne, both situated in the Alpes de Haute-Provence (France). These two studies bring a new dimension on the origin of the wood used for making mediaeval bells underlying the riparian forest (Populus/salix) and the beech forest exploitation, respectively.

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347 SOMEWHERE BEYOND THE SEA: SEAFARING, SEAFARING SOCIETIES AND INTERCULTURAL EXCHANGE IN PREHISTORIC EUROPE

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Schulz Paulsson, Bettina (Sweden) - University of Gothenborg
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Keywords: Prehistoric seafaring, mobility, Europe
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Current research into prehistoric mobility is revealing that long-distance connections were far more prevalent in Neolithic and Bronze Europe than hitherto supposed. Megaliths, green stone artifacts, obsidian, metals and coastal rock art are delivering evidence for long distance maritime linkages. This represents the kickoff for a new scientific debate regarding the mobility of Neolithic and Bronze societies, the nature of these interactions through times and the development of seafaring. Control of long distance maritime exchange is in a general sense seen as a fundamental feature for the development of complex ranked societies. Evidence for maritime exchange however, is often limited to the pattern and transfer of the material culture. Little is known regarding the seafaring capabilities of these societies, their organization and motive forces for long-distance travels. The session will examine:

1. Early maritime technology and the reconstruction of potential seafaring routes in the Stone and Bronze ages along the European coasts.
2. Prehistoric maritime linkages, networks and cultural interactions in all its variety from travels, to expeditions, and population migrations etc.
3. The role that watercraft technology and long distance exchange played in the development of social complexity.
4. The transmission of a similar cosmological worldview through the seaway and a shared symbolic identity
5. The environmental conditions for prehistoric seafaring as changes in sea levels and ocean circulations

01 ...AND A STAR TO STEER HER BY – REMARKS ON EARLY OPEN WATER PASSAGES

Author: Dr Weski, Timm - retired (Presenting author)
Keywords: Navigation, Simple Watercrafts
Presentation Preference: Oral

The evidence for domesticated animals on islands in the Mediterranean Sea in Early Neolithic times, the settlement of the Orkney Islands or the distribution of similar bronze objects in Britany and Cornwall indicate the possibility to cross open waters regularly. On the other hand our knowledge about the boats used for this purpose is very limited. But there are a few indications for the utilization of logboats perhaps with washstrakes and skin boats. The means of propulsion remains open, as the introduction of sail in the Mediterranean Sea as well in Northern and Western Europe is still unsolved. The passages led either through dangerous waters with strong tidal currents like the Pentland Forth between Scotland and the Orkneys or across open waters up to a hundred nautical miles. Therefore the people of the Neolithic Period or the Bronze Age must have had a considerable nautical knowledge. Looking on navigation aids known from younger periods and other regions like Polynesia several methods of finding the way across open sea can be deduced. Even if some of the results are hypothetically it is possible to show that even in early periods men had the capacity for long distance seafaring including the knowledge how to cope with strong tides.

02 SHARED VALUES - INVESTIGATING WORLDVIEWS IN MEGALITHIC EUROPE

Author: Dr. Higginbottom, Gail - Australian National University (Presenting author)
Keywords: megaliths, shared-values
Presentation Preference: Oral

It seems to have gone 'unheralded', that by 3000 BC, both Germany and Scotland were constructing simple standing stone monuments that were often associated with the dead (Bradley 2011; Burl 1993; Kirchner 1955; Richards 2013). The main differences being that there are no confirmed Neolithic or Bronze Age stone circles in central or northern Germany, and within central Germany there are examples of decorated menhirs without obvious anthropomorphic features as well as standing stones forms alluding to anthropomorphic features or qualities (defined by ornaments, belts and necklaces), evoking similarities to those found elsewhere from Italy to central to eastern Europe (Kirchner 1955); decorative evidences are fewer in the Neolithic and Bronze Age standing stone monuments of Scotland and carved anthropomorphic features are not apparent. So why were these distant regions choosing to erect similar standing stones in their landscapes, what shared understandings and significances were connected to them? Are the shared significances possible evidence of concurrent shared values or are they a delayed aggregation with some reformulation by the indigenous populations in Scotland? Does Scotland in fact have direct connections with Germany at this time or were these adoptions funneled through other cultures, like Ireland (the latter argued by many; Burl 1993). These are important notions to understand if we are to come to any understanding of how life-ways and values evolved and melded across greater Europe, notions that many relevant publications, apart from Kirchner, have overlooked.
This paper introduces the notion of why it was possible that there was a transmission of either a similar cosmological worldview or at least related notions of the power of the dead and standing stones through the seaways and a shared symbolic identity across some regions and what some of these might be, using evidence from previous studies.

03 THE BAY OF BISCAY IN THE "LONGUE DURÉE": PHYSICAL GEOGRAPHY, BOATS AND POTENTIAL SEA ROUTES FROM PREHISTORY TO LATE ANTIQUITY

Author: Mr. Latorre-Ruiz, Juan - University of Oxford (Presenting author)
Keywords: Atlantic, long-term, connectivity
Presentation Preference: Oral

The shores of Northern Iberia and Western France delimit the Bay of Biscay or "Golfe de Gascogne" in French. A gulf dominated by sandbars and a rugged coastline that stretches from NW Iberia to Brittany. Despite these difficulties, there is enough archaeological evidence to suggest at least a low-level of contact in the region between the Neolithic and the Middle Ages. In this case, Braudel's "longue durée" will be used to study connectivity between the regions of the Bay during that interval. To do so, three sources of data will be combined. The physical features of the Bay, including winds and currents, the archaeological and written evidence about the boats used and the distribution of key archaeological artefacts. By doing this, we seek to understand how the areas of the Bay of Biscay were connected at different periods of time. At the end, it will be proposed that

the physical features of the Bay, despite the environmental changes, favoured certain patterns of mobility that emerge when taking a long-term perspective. Patterns of mobility and the "longuee durée" approach have the potential to help us better understand the distribution of Neolithic and Bronze Age "items" (rock-art, megaliths, metalwork) and how prehistoric communities were connected.

04 MEGALITHIC JOURNEYS: MOBILITY AND MARITIME INTERACTION IN EUROPE IN THE 5TH AND 4TH MILLENIUM CAL BC

Author: Dr. Schulz Paulsson, Bettina - University of Gothenborg (Presenting author)
Keywords: Megaliths, maritime voyaging
Presentation Preference: Oral

The majority of the approximately 35,000 remaining megaliths in Europe were constructed along the coasts between the 5th and the 3rd millennium cal BC. This coastal setting of the megaliths indicates maritime cultures and maritime interaction, even though the model of an independent emergence of megaliths and megalithic societies has remained a dominant theme in the research literature since the early Seventies. This paper presents evidence for the mobility of megalithic societies and megalithic maritime voyaging based on the results of recent research into available radiocarbon dates, the trade of green stone and megalithic art.

05 A SHIP DEPICTION ON A CREMATORY URN FROM THE DANISH EXCAVATIONS AT HAMA, LEVEL F, RECONSIDERED

Author: Professor Wachsmann, Shelley - Institute of Nautical Archaeology at Texas A&M University (Presenting author)
Keywords: Sea Peoples, Urnfelder
Presentation Preference: Oral

In their excavations in Syria at Hama during the 1930s Danish archaeologists uncovered a remarkable stratum—Level F, Early Period—which they dated to ca. 1200-1075 B.C. This stratum contained some 1,100 cremation burials in urns along with a material culture that included European-style fibulae and flange-hilted swords. W.F. Albright remained adamant that the appearance of cremation at Hama must be due to Hittite influence and believed it unlikely that the Sea Peoples could have reached as far inland as Hama. One of the decorated urns from Hama, however, bears a painting of an Aegean ship type used by the Mycenaeans and the Sea Peoples during the latter part of the Late Bronze Age and the beginning of the Iron Age. The Danish excavators published only a painting of the Hama ship representation, on which all subsequent research has been based. The urn now resides in the Danish National Museum, Copenhagen where in 2013 I examined and recorded it. In this presentation I will discuss the Hama ship depiction and its significance for our understanding of the Sea Peoples phenomenon. The Aegean-style galley painted on the Hama urn indicates that the Hama urnfield, contra Albright, must have been created by a group of Sea Peoples. The Hama ship depiction precludes previous arguments that cremation at Hama developed locally, while also explaining the otherwise incongruous appearance of European-style artifacts in Level F. The vessel raises the possibility that a migrant group descendant from the contemporaneous central European Urnfield culture created the Hama cremation field. Additional evidence for Urnfield penetration into the eastern Mediterranean may be seen in the five representations of a Sea Peoples' ship at Medinet Habu which, while Mycenaean in design, bear outboard-facing birdhead devices at bow and stern, thus replicating the typical Urnfield Vogelbarke (Bird Boat) motif.

06 PAINTING THE NEOLITHIC: COASTAL ROCK ART FROM THE BALKANS TO THE IBERIAN PENINSULA AS A POTENTIAL MARKER OF MARITIME INTERACTION

Author: Prof Díaz-Andreu, Margarita - ICREA; Universitat de Barcelona (Presenting author)
Co-Author: Dr Dawson, Helen - Topoi Excellence Cluster; Freie Universität Berlin; Dr Mattioli, Tommaso - Universitat de Barcelona
Keywords: rock-art, maritime-connections, Neolithic
Presentation Preference: Oral

The Iberian Peninsula is well known in rock art research for the Schematic rock art tradition, which consists in paintings, mainly in red colour, of basic figures and symbols of anthropomorphs, animals, geometric motifs in rock shelters. It is widely believed that this artistic tradition originated towards the middle of the 6th millennium BC when the first economic and technological evidence of the Neolithic is documented in the Mediterranean area of the Iberian Peninsula. Intriguingly, schematic rock art sites are well documented also in many coastal regions of the Central Mediterranean, from the wide embayment of the Gulf of Lyon in France to the southern part of the Italian Peninsula, from the biggest islands (Corse, Sicily) to the immediate hinterland of the Balkan Adriatic coast. In this paper, we consider whether similarities in coastal rock art are supported by a model of maritime spread of the Neolithic, as seen from other classes of material evidence. On current knowledge, the Neolithic spread was not continuous but featured both temporal and spatial gaps ("jump dispersal" or "leap frogging"), which would fit with the known distribution of schematic paintings en-route from east to west. Evidence of long distance interaction and transfer of shared symbolic identities are discussed in the context of maritime connections, painting a fuller picture of the Neolithic.

07 ROCK ART, SEASCAPES & LONG DISTANCE TRADE

Author: Associate Professor Ling, Johan - Univeristy of Gotehnburg (Presenting author)
Keywords: Rock art, seascapes
Presentation Preference: Oral

Warriors in staged scenes on-board war canoes or adjacent to war canoes are common features in the Scandinavian rock art from the Bronze Age. The rock art appears at the same time as the Scandinavian societies become engaged in long distance trade of metal. Local warriors would have increasingly played an important role in the metal trade. Elite household's investment in the maritime forces of production, ships and warriors, was therefore a crucial feature for the engagement in this kind of action. The ability to fund boat construction and crew ships provided a new control apparatus, for maritime ventures, based on ships ownership. This would have favoured the rise of maritime polities in Scandinavia. In this paper I argue for the notion that the praxis of carving ships onto the stone could have served to manifest the agency of the maritime warriors

348 ARCHAEOLOGY AND LARGE INFRASTRUCTURAL PROJECTS

Theme: 2. The Valletta Convention: the next 25 years
Author: De Moor, Jos (Netherlands) - EARTH Integrated Archaeology
Co-Author(s): Vandenborre, Jeroen (Belgium) - BAAC VlaanderenHuisman, Jerry (Netherlands) - Prorail
Keywords: Infrastructure, planning, opportunities, new techniques
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

With a rapidly growing population, there is an increasing pressure on the infrastructure in and around large cities. Therefore, increasing the capacity of for instance for rail and road infrastructure is of primordial importance. Furthermore, increasing flood risks require measures to be taken in river valleys and in coastal areas.

One of the potential delaying factors in the planning and construction of large infrastructural projects is archaeology. Therefore, a proper project planning and preparation is imminent and preferably archaeology is already part of the Environmental Impact Assessment (EIA) of the project. Concerning the archaeological research, especially in these large projects a thorough desk-based assessment, a geo-archaeological assessment and the development and application of new methods and techniques are essential. Moreover, it is important that archaeology can be seen as an opportunity for the developers. There is an ongoing dialogue with several countries to get a broader view of these issues and during this session, we would like to discuss several aspects involving large infrastructural projects and the way archaeological research has/will been dealt with.

- What was the focus of the project - what choices/decisions had to be made in order to fulfil requirements of archaeological research and in the meantime guarantee the project planning?
- During which part of the project planning was archaeology involved?
- What were the applied methods?
- What to do when changes in the draft of the route take place after archaeological research has been carried out

01 ARCHAEOLOGY IN LARGE INFRASTRUCTURAL PROJECTS IN THE NETHERLANDS

Author: Drs Vreenegoor, Ellen - Rijksdienst voor het Cultureel Erfgoed (Presenting author)
Keywords: National-projects, archaeological-heritage-management, landscape-archaeology
Presentation Preference: Oral

In national large infrastructural projects in the Netherlands archaeology is always incorporated due to the agreement between the Cultural Heritage Agency of the Netherlands (Ministry of Education, Culture and Science) and the national public works agency of road and water management (Rijkswaterstaat, Ministry of Infrastructure and Environment).

This paper reflects on 20 years of archaeological resource management in large infrastructural projects and on the principles and methods used in the field research.

The Cultural Heritage Agency participated as adviser to Rijkswaterstaat in railway projects like the high speed railway to Paris (HSL), new national highways and large-scale projects along the main rivers to improve flood risk management and navigation in combination with exploitation of sand and gravel and nature development. In the period between 1998 and 2017 these activities destroyed thousands of hectares of land.
The projects took place in a period of great change: new legislation on spatial planning and archaeology came into force, archaeological fieldwork became a market activity, and a quality standard on archaeology was introduced. In all projects we tried to focus on the development, occupation and use of the landscape in the past and on the relations between these aspects. The results broaden and deepen our knowledge of occupation and land use during different periods and in different landscapes. They are important from a national archaeological perspective as well as in terms of archaeological heritage management. Data from the projects were also used in new tools like predictive maps of the whole river area (Rhine, Lek, Waal, IJssel and Meuse).

02 RIJKSWATERSTAAT AND ARCHEOLOGY CO-OPERATE, ADAPT AND INTEGRATE

Author: Dr Gehasse, Eli - Rijkswaterstaat - Water, Traffic and Environment (Presenting author)
Keywords: Rijkswaterstaat, Infrastructure, Covenant
Presentation Preference: Oral

In 2007, following the implementation of the Valletta Convention into the Dutch legislation, Rijkswaterstaat (RWS: being the executing organization of the Ministry of Infrastructure and Environment) has conducted an agreement with the Cultural Heritage Agency of the Netherlands (RCE) on archaeological research and finds at the execution of infrastructural works.

In this Covenant, the following issues are treated:
- Adapting the infrastructural and archeological procedures
- Cost control
- Relationship archaeology and integrated forms of contract (DC and DBFM)
- Relationship archaeology and management tasks
- Exchange of information and development of knowledge

The Covenant is further elaborated in an internally guidance document Archaeology and Infrastructure. And archaeological research is included in the RWS estimate and contract systems.

In this presentation the previous will be explained and made more specific with examples from RWS-projects. Also attention will be given to large-scale projects in the water bottom (such as wind parks at sea and man-made islands in the IJsselmeer) and on changing modes of tendering of infrastructure projects.

03 INTEGRATION OF GEOPHYSICAL PROSPECTION IN LARGE INFRASTRUCTURAL PROJECTS

Author: Ullrich, Burkart - Eastern Atlas, Berlin (Presenting author)
Co-Author: Kniess, Rudolf - Eastern Atlas, Berlin; Dr De Neef, Wieke - University of Groningen; Noorda, Nikolaas - University of Groningen; Zoellner, Henning - Eastern Atlas, Berlin
Keywords: Infrastructure, planning, archaeogeophysics
Presentation Preference: Oral

We discuss the integration of geophysics as a geo-archaeological prospection method in large-scale infrastructural projects. Of a wide range of techniques, magnetometer surveys are most commonly used for large-scale mapping. The integration of magnetometer surveys in the cultural assessment of large areas is discussed using two examples, each highlighting different frameworks of planning and implementation, survey conditions and technical solutions: highway construction in Western Europe, and an airport in the Near East.

The project take advantage of all opportunities afforded by geophysics if the prospection is already considered during the planning state of the project. Our first example, of highway construction in western Europe, shows a structured and strategic framework for the management of the archaeological aspects of road planning and construction. Here geophysical surveys are planned either as targeted surveys or non-site oriented surveys of the impacted areas. The results are integrated in regional cultural heritage management strategies.

The second example, of the extension of an airport in the Near East, shows the integration of geophysics in an existing archaeological research projects which suddenly turned into a rescue project. The outcomes of the survey turned out to be valuable for the planning of further archaeological work to protect and investigate a critically endangered site.

The requirements of the geophysics in both case studies are similar: large areas should be surveyed with a high resolution almost completely within a very short time frame. We used the ultra-light and flexible magnetic survey system LEA MAX (Eastern Atlas), which can easily be transported and built up quickly in the field. In our examples, we point to the technical adjustment of the system to local survey conditions. For large open areas the device can be used in the ATV mode, while even areas with limited access can also be surveyed very efficiently.

04 ALL ALONG THE BYPASS BAARLE

Author: Drs. Van Oosterhout, Floris - Arcadis (Presenting author)
Keywords: International collaboration excavation
Presentation Preference: Oral

During most part of 2015, the three largest archeological companies in the Netherlands (ADC, BAAC and RAAP) combined their forces to carry out a large scale excavation stretching out over 15 hectares both in the Netherlands and Belgium commissioned by the Province of Noord-Brabant. The excavation was necessary because a bypass is being built in an area where test trenches had shown that the soil yielded rich and divergent archaeological sites.
The large scale infrastructural project was unprecedented, not only because of the importance of the expected archaeological remains and the size of the acreage to be excavated, but maybe even more so because of the complex administrative situation. The excavation crossed parts of the Dutch municipality of Baarle-Nassau and the Belgian municipality of Baarle-Hertog. The two municipalities are intertwined and enclaves of Belgium and the Netherlands are scattered along the territory. On several occasions the border was crossed (and documented) in the excavation pit. The Netherlands and Belgium have different laws and rules regarding their archeological heritage, that had to be obeyed. This concerns the regulation of permits, ownership of archaeological objects unearthed during the excavation and even who has the authority on matters of archaeological research and cultural heritage management.
To achieve maximum scientific results and to manage this project in an efficient and workable way, the excavation was executed using an integrated approach by the contractor. During the preparation, the fieldwork and analysis all stakeholders collaborated as a team in which each participant fulfilled their specific role, whether it was as client, owner of the finds, local authority or consultant without losing sight of the joint target: gathering knowledge by excavating and preserving archaeological remains in a responsible way, both in the eyes of the archaeologists and the general public.

05 PEOPLE, PLACE AND TIME: DELIVERING A RESEARCH FOCUSSED STRATEGY FOR HIGH SPEED 2

Author: Dr Halsted, John - High Speed Two Ltd; Atkins Global
Co-Author: Mrs Wass, Helen - High Speed Two Ltd (Presenting author)
Keywords: objectives, collaboration, delivery
Presentation Preference: Oral

Phase One of HS2 will represent the largest programme of historic environment works ever undertaken in the UK. The linear route from London to Birmingham and into Staffordshire will extend across a distance of approximately 230km and across the grain of the landscape of southern and central England through varying geologies, topographies and regions.

An innovative approach is, therefore, required to deliver high value knowledge and maximise public benefit, from a defined budget and within a defined timeframe. The Historic Environment Research and Delivery Strategy (HERDS) has been designed to provide a research focus for the historic environment works, alongside involving communities and developing sector skills. The approach taken has been to develop a series of key research themes and specific objectives. These objectives have been defined following an extensive resource assessment and consultations with the academic community, local authority stakeholders, the heritage industry and Historic England.

All historic environment works will be designed to contribute to these specific objectives, which are defined at location specific, region focussed and scheme wide scales. Collaboration will be required between HS2 Ltd and historic environment contractors across the route and mechanisms will be put in place, including a dedicated online GIS, web portal and round table meetings to facilitate the management and discussion of ongoing works, interim results and comparative data.
This paper will discuss the HERDS approach, provide examples of specific research objectives and discuss the mechanisms for the implementation of the archaeology and heritage programme for Phase One of HS2.

06 TARGOWISKO PROJECT ON THE LINE OF MOTORWAY A4 IN SOUTHERN POLAND

Author: Prof. Dr. Kadrow, Slawomir - Instytut Archeologii i Etnologii Polskiej Akademii Nauk (Presenting author)
Keywords: preventive archaeology, motorways
Presentation Preference: Oral

As a result of large rescue excavations carried out in the years 2003-2006 along the lane of the A4 motorway in the loess areas in south-eastern part of Poland, concentrated in the vicinity of Targowisko village, many discoveries were made which marked a fundamental break in the scale of field works and our knowledge of prehistory regarding Polish territories. At the same time this project is an excellent illustration of the principles and the level of preventive archeology in the best period of its development in our country. This project was completed before construction of the motorway. Archaeologists possessed relatively long time for its implementation. The level of financing was also sufficient. Until that moment appeared a lot of serious material publications and some attempts at prehistoric interpretation and synthesis in regional and wider scales. Obtained results provoked new questions and fomulation of new projects. Comparing parameters of the Targowisko project with the field tasks performer recently, we see the scale of the crisis of preventive archeology in Poland in financial, organizational and instutucjonalnym aspects in the last few years. What is clear, it decreased the level of scientific studies and the degree of popularization of the obtained results. In this paper I proposed several legal and organizational solutions aimed at overcoming the crisis of preventive archeology, that do not require a drastic increase in the level of financing. Instead, they require redefinition of the relationship between private and institutional (university or academy) archeologies.

07 HANS BRINKER, OR HOW TO BRIDGE THE GAP: HOW THE DUTCH MANAGE TO COMBINE ARCHAEOLOGICAL HERITAGE MANAGEMENT AND DYKE REINFORCEMENT.

Author: Drs Oudhof, Jan.Willem - Buro de Brug (Presenting author)
Keywords: heritage-management, dyke reinforcement,
Presentation Preference: Oral

For the past 60 years, not a single person has been killed in floods in the Netherlands. This is partly thanks to our dikes. The Netherlands are facing the largest dike reinforcement task in the country's history.
Due to stricter safety standards adopted by the Dutch government, 1,100 km of dikes have
failed to pass the safety tests and will require repairs and maintenance by the year 2028.
How do we accomplish this without causing inconvenience to inhabitants and excessive
social impact? Part of risk-management is a good insight in the archaeological consequences of dyke reinforcement. This involves not only the dike itself, but also the surroundings (both land and water). As part of de Alliance Markermeerdijken, Buro de Brug is handling the archaeological heritage management in a 33 km dike reinforcement of the monumental IJsselmeerdijk. between the city of Hoorn and the city of Amsterdam. The main theme will be the old saying: penny wise pound foolish, and how to avoid this. The contribution will focus on how to use archaeology as oil in the engine instead of sand in the machine, concerning both social impact and project planning . Archaeology as an opportunity, not as a risk.

08 TUNNEL VISION? CONSTRUCTING A RAILWAY TUNNEL THROUGH THE MEDIEVAL DEFENCES OF DELFT.

Author: MA Penning, Bas - Gemeente Delft
Co-Author: Drs. Jongma, Steven - Gemeente Delft (Presenting author)
Keywords: Medieval Defences Netherlands
Presentation Preference: Oral

From 2010 onwards a large part of the city of Delft, located in the west of the Netherlands, has been a construction site. The railway overpass built in the 1960's was demolished and replaced by a railway tunnel. With this development the capacity of the railway has doubled and the look of the city improved. Combined with the construction of the railway tunnel, the entire railway area is being redeveloped. This includes the building of a city hall, parking garages, and residential areas.
The area in which all these developments has taken place is of high archaeological importance. The railway tunnel was constructed on the western edge of the Medieval city and with its construction many defensive structures, such as gates, towers, the city moat, and rampart were threatened.
As the area is currently intensively used by a variety of traffic types and there were several buildings with poor foundations in close proximity to the construction site, several technical precautions were necessary. Archaeological research was therefore only possible during the construction of the tunnel.
The initiator of the railway project, ProRail, acknowledged the importance of the archaeological remains and funded the research. They also assisted in including the archeological research in the construction workflow.
The archaeologists of Archeologie Delft and the people of the construction company Combinatie CrommeLijn worked together for the last seven years. The importance of communication was clear from the beginning. By explaining the archaeological goals and methods to the construction company, and listening to their goals and methods, successful cooperation was possible. This led to a lot of new knowledge about the historic city of Delft and its inhabitants, and it gave the construction company the possibility to communicate positive news during a project which creates a lot of nuisance for the inhabitants of the city.

09 ARCHAEOLOGY AND CITY PLANNING IN KØGE, DENMARK

Author: Curator Kjærgård, Annemette - Museum Southeast Denmark (Presenting author)
Keywords: archaeology, cityplanning, legislation
Presentation Preference: Oral

In 2011 a large scale development project was launched in the city of Køge. It involves the restructuring of infrastructure and development of old and new areas for different types of construction for housing, business and culture. It meant changing an area equivalent in size to half the medieval town.
Museum Southeast Denmark initiated a collaboration between the museum and the company Køge Kyst, the initial and overall projectmanager and developer. The museum performed an initial screening with the purpose of clarifying all aspects of archaeological interests according to Danish antiquity and museum legislation and to ensure a good collaboration between museum and the many different developers and builders. The goal was to incorporate the archaeological interests in the planning process, thus ensuring

that the many different remains would be either excavated or preserved on site. The selling point with regard to the developers was partly to minimize significantly more expensive construction costs and avoid standstills in the building process.
Since then there have been performed several screenings, exploratory studies and excavations and final excavations. The archaeological work is still ongoing, but so far, we have completed about 70% of the project, and we expect to complete the final excavation in 2018.

This presentation evaluates the different aspects of the archaeological work so far. The museums work in relation to the various projects many stages and various screening and appraisal methods will be presented and evaluated. It will focus on both what worked and what did not. The change the museum's work has undergone along the way will also be discussed.

10 RIDING ON TIME: MANAGING ARCHAEOLOGICAL RISKS IN THE A2 TUNNEL PROJECT IN MAASTRICHT, THE NETHERLANDS

Author: Dr. Isarin, René F.B. - Crevasse Advies (Presenting author)
Co-Author: Drs. Soeters, Gilbert - Gemeente Maastricht
Keywords: Maastricht, Heritage-management, Risk-management
Presentation Preference: Oral

In December 2016, the 2300 meter long A2 motorway tunnel in Maastricht was opened for traffic, solving a major congestion problem that existed for many years. In 2009, archaeological research started with desk - top analysis, via auguring campaigns, trenching and excavations ultimately leading to a significant scientific contribution to regional archaeology. The research was carried out well within budget and time, the results of which were frequently shared with the public. Importantly, the actual building process was never in danger at any time. Our presentation aims at describing the main aspects of the research process and that of risk-management and decision-making, in which classical conflicts of interest between initiator and contractor on the one hand, and governing authorities on the other were minimal. Evidently, some of the archaeological highlights are presented, including an early Neolithic Bandkeramic village encompassing at least 29 houses. During the latter excavation, which was contracted in an experimental 'Design & Construct' format, earthworks from a fortification (1632) used in one of the sieges of Maastricht, were found also.

11 CROSSRAIL'S ARCHAEOLOGY AT LIVERPOOL STREET – A CASE STUDY

Author: Mr Carver, Jay - 4AD Consultants; Crossrail Ltd.
Co-Author: Miss Leenstra, Marit - Museum of London Archaeology (Presenting author)
Keywords: Archaeology, Infrastructure, Crossrail
Presentation Preference: Oral

In 2011, Jay Carver et al. published a case study on the preliminary works for a large scale burial ground excavation at Liverpool Street. This paper looked at how a wide variety of desk study sources, reconnaissance exercises, ground deposit modelling and site testing evaluation methods had allowed the development of an informed project design to be developed for detailed excavation, recording and presentation of results at Liverpool Street, one of the main new Crossrail station sites in central London.

In 2015, the main archaeological excavation took place at Liverpool Street and thousands of graves from the Bedlam burial ground, a 16th-18th century overflow burial ground, were excavated. Quantitative data was collected before and during the burial ground excavation works in order to monitor progress and evaluate the success of the preliminary works. Jay Carver and Marit Leenstra's recent paper reflects on the questions related to the programme, resourcing and risk management for this burial ground excavation and archaeological investigation.

On the basis of these two papers, this case study considers the challenges of planning such a complex archaeological excavation within the construction programme for a large-scale infrastructure project and analyses the ultimate results of careful planning and execution of the project.

349 HUNTERS OF THE LOST STORY

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Soininen, Tuija-Liisa (Finland) - Museum Center Vapriikki
Co-Author(s): Richardson, Phil (United Kingdom) - Archaeology ScotlandDoyle, Ian (Ireland) - Heritage Council of Ireland
Keywords: Story, Place, Society, Community
Presentation Preference: Round table

The function and meaning of places change over time. Each period may swipe off part of the meanings but also leaves its own marks on places. In heritage work the multidisciplinary approach to places is important because it creates more meaningful stories which in turn may increase the social and societal meaning of archaeology. Stories create images and meanings and they can make the place more understandable and significant for society. Archaeological research produces material for new stories but stories may also arise from personal and collective experiences which should be taken into account. Therefore it is essential that archaeological research has also a close connection with community-led heritage actions and other social aspects concerning places of heritage.

The round table discusses the relationship of stories and places from following viewpoints:
- How to use the stories in archaeological research and management work? The modern thesis in preserving built heritage is that "stories protect buildings". Does the idea work in archaeological heritage management too?
- How and when to give space for non-archaeological stakeholders in archaeological projects?
- What is the role of different groups such as preschool children, adopters in Adopt a Monument schemes or metal detectorists in creating significances with stories? In what way may old and new stories affect heritage?

01 A DISAPPEARED CITY. MEMORIES, STORIES AND HOMES IN THE RENEWED CITY

Author: Researcher Kuitunen, Hannele - Pirkanmaa Provincial Museum (Presenting author)
Keywords: heritage, stories, city
Presentation Preference: Oral

Heritage is researched and managed by variety of different kind of aspects, professions and branches of science. It offers a wide scale of possibilities to multidisciplinary work and discussions. In this paper I´ll handle heritage as built heritage and from the viewpoint of a researcher on historical buildings.
Finnish city renewal process during 60´s and 70`s created totally new layers in the city scape. I´ll focus on stories and memories that are told and expressed by the citizens and inhabitants of former workers` living district called Amuri. Amuri was built during the end of 19th century and was one of the biggest wooden living districts in Finland. It was totally rebuilt until 1980`s. New concrete flat houses were built on the basis of old street grid in order to better the living conditions in Amuri. Where did the city go? Did it take the stories with it?
I´ll try to find out how meanings are created by people and by their memories and stories. What is the story of the disappeared city like? Are there new stories told about the new buildings? To what extend stories of the disappeared city are basis for the cultural heritage process run by the local societies? This kind of area is an example of a place and space which is at the same time visible and invisible, material and immaterial, heritage that should be protected and district that should be developed. New tools may be found by going over the borders between different scientific fields and professions or material and immaterial concepts of heritage. It is time to think if stories are useful in planning process and what is considered valuable in the city which is not exiting anymore.

02 DIFFERENT STORIES, ONE MONUMENT: NEGOTIATING COMMUNITY NARRATIVES WITH ARCHAEOLOGY SCOTLAND'S ADOPT-A-MONUMENT SCHEME

Author: Ms Jones, Cara - Archaeology Scotland
Co-Author: Mr Richardson, Phil - Archaeology Scotland (Presenting author)
Keywords: narratives, monuments, scotland
Presentation Preference: Oral

Archaeology Scotland's Adopt-a-Monument Scheme has now been running for over 20 years in Scotland and we aim for each individual project to be community led. We help facilitate the running and completion of each project, but the main aims and objectives of each project are decided by the community group. We believe this community-led approach is crucial to the long-term sustainability of each project - it empowers groups to take that lead role in running and maintaining a heritage stewardship project.

However, the challenges we face at some monuments can sometimes include incorporating and negotiating the different narratives and interpretations of a monument. These community narratives can include not only the group's statements of significance and importance of a monument but also the very interpretation of the site. At times, these community narratives clash or fit awkwardly with national heritage policy, guidance and frameworks. These clashes can stem from the decision of what monuments should be designated as a 'Scheduled Monument' to what information should be written on the 'official' description of a monument or 'presented' within an interpretation panel.

Scotland has a long and varied tradition of folklore and oral history associated with landscapes and archaeological monuments and this often intangible heritage is only just beginning to be recorded and recognised as 'valid' narratives of a site or location, information that should be retained for future generations.

This paper will draw upon key examples of where these clashes of narratives have taken place and how we have tried to support the group to incorporate their stories into the 'official' record of a monument.

03 TOLERANCE AND STORIES IN ADOPT A MONUMENT -SCHEME

Author: Reseacher Lähdesmäki, Ulla - Pirkanmaa Provincial Museum (Presenting author)
Keywords: Adopt-a-Monument, story, tolerance
Presentation Preference: Oral

Since 2008 Adopt a Monument activity has increased local involvement in cultural environment in a new way in Tampere Region, Finland. Through AM-scheme different groups and communities have found and created their ways in supporting and experiencing archaeological and built heritage. The scheme has added possibilities to increase people's wellbeing and not just managing heritage.

Next to voluntariness the AM-activity is characterized by citizens' right to ascribe their own meanings to e.g. tangible heritage. One of the features that also have evolved in the activities during the last years is tolerance. The question of tolerance is fundamental weather it concerns adoption groups and society but also the tolerance in relationship of archaeologists or other professionals and adopters. Adopters' own meanings of heritage has produced various stories, which are self-evident in the scheme but may sometimes cause dissonance or contradiction between adopters and professionals.

Stories and narratives are an essential part of the AM-activity. There are at least two kinds of stories connected to adopters and heritage: the stories enlivening the disappeared past created by archaeologists and adopters and stories which connect the adopters' experience of heritage to present. This presentation discusses the role of adopters in creating significances with stories, particularly from the viewpoint of tolerance.

04 LISTENING TO THE STORIES OF ISTANBUL GRAND BAZAAR

Author: Dr Yalman, E. Nurcan - CIE-Center for International Heritage Activities Leiden; Cultural Awareness Foundation Istanbul (Presenting author)
Keywords: Story, Community, Heritage
Presentation Preference: Oral

Since its establishment in the 15th century, the Grand Bazaar of Istanbul has been a commercial and political center of the city. It is now a popular tourist attraction, serving as an authentic and historical environment for tourists. Its social importance however continues to pulsate through its stores and workshops, the stakeholders of the project, some

reaching as far back as 5 generations. Their memories and stories, collected through centuries, reveal an essence of the Grand Bazaar that deepens our understanding of its value that goes beyond the value of passing shoppers and tourists and into the histories and narratives of universal significance that the shopkeepers can help uncover.
We have conducted a pilot project in 2014 for two months and it showed us not only the amazing variation in the different communities but also an existence of a shared identity. We continue our work this year, but this year the stories will be gathered in a way that spread throughout the Grand Bazaar, concerning the social layout to be understood and also with additional questions. This presentation is not going to focus merely historical stories but stories/memories of the present day as long as they tell us what living communities think and feel about the place. By this project, we are hoping to add these unarchived stories to the official history of the Grand Bazaar and provide different and complementary perspectives. I would like to present several selected video clips of those stories in my presentation.

351 FARMING BY FIRE.THE ARCHAEOLOGY OF SLASH AND BURN CULTIVATION IN A COMPARATIVE PERSPECTIVE

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Vestbö Franzén, Ådel (Sweden) - Jönköping County Museum
Co-Author(s): Tomson, Pille (Estonia) - Estonia University of Life SciencesLorentzon, Moa (Sweden) - Kronobergs County Regional Board
Keywords: Pedoanthracology, slash&burn, economics, vegetation
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

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The session aims to highlight differences and similarities in how we investigate and interpret the remains of slash and burn cultivation in an area from Russia to the British Isles. What was the impact of slash and burn cultivation on vegetation and landscape, which are the physical remains and what kind of economic institution does the different kinds of slash and burn-practices represent? Most of the research hitherto has been carried out as collaborating projects between archaeologists, human geographers and quaternary geologists using a variety of methods and sources i.e. archaeology, pedoanthracology, pollen-analysis and examination of historical maps.
While the huhta slash and burn tradition of especially the coniferous regions of Finland and northwestern Sweden has been thoroughly studied, the knowledge of the kaski slash and burn cultivation on deciduous forest during prehistoric, medieval and historic times in The Baltic, the British Isles and Southern Scandinavia is rudimentary. We can outline some similarities and some differences in dating, practice, and how it affected the vegetation. A common denominator seems to be that slash and burn cultivation were used in addition to the grain production on permanent fields and therefore poses questions concerning using rights to outlying land and forest areas.
The practice of slash and burn cultivation or swidden cultivation has had a profound impact on the formation of the landscape, patterns of vegetation and forest covering. Which are the physical remains? Is there a potential connection between slash and burn and clearance cairns?

01 HOW TO IDENTIFY AREAS THAT HAVE BEEN USED AS KASKI-SWIDDEN-LAND BEFORE 1800. METHOD: LARGE SCALE GEOMETRICAL MAPS.

Author: Human geographer Tollin, Clas - riksarkivet (Presenting author)
Keywords: Swidden-culture, largescale-maps, map-overlay
Presentation Preference: Oral

Since the 13th century ward there has been swidden-activity in southern Sweden. Little is known about these small "kaski-swidden-land". The interest have until now been concentrated to the large scale "huutha-swidden-land" from the 16th and 17th century. This slash and burn culture was mostly created by people from the province Savolax in Finland. To closer understand the slash and burn activity it is useful to define some terms. The burn-culture had different purposes. Firstly to burn bush-vegetation and young trees in order to cultivate grain and turnips for a shorter period so called "svedjebruk". Secondly fire also could be used to improve meadows, pastureland and to clear woodland for permanent arable land. The kaski-swidden-land were mostly created in woody commons belonged to certain villages and hamlets.
Thanks to some large scale geometrical maps is it possible to estimate the size and situation of the kaski-swidden-culture. In this presentation map overlay method is used on some 18th centaury large scale maps. Hopefully the result helps us to better understand the vegetation and biological situation before the agrarian revolution and modern forestry. The swidden-culture may also explain how farmer-families could survive in spite of small and poor giving permanent arable land during medieval and early modern time in southern part of Sweden. The kaski-swidden-land might have been the solution.

02 SLASH AND BURN AS AN ECONOMIC INSTITUTION AND THE DYNAMICS OF OUTLYING LAND. AN EXAMPLE FROM EARLY MODERN SOUTHERN SWEDEN.

Author: PhD Franzen, Adel Vestbo - Jönköpings county museum (Presenting author)
Keywords: economics landscape dynamics
Presentation Preference: Oral

During the late medieval agrarian crisis slash and burn, or swidden cultivation, proved to be a rational way of grain production when manpower was scarce and woodland an abundant resource. In the uplands of Southern Sweden a dynamic utilisation of outlying resources was based on the fact that husbandry and not grain-production formed the economic base. Nevertheless, grain had to be produced, in order to pay tithes, produce porridge and brew beer.
Swidden cultivation in the kaski-tradition during early modern times can be examined through two main sources: the large scale cadastral maps and the legal documents from the local courts. The paper focuses on the gradual changes in the organization of swidden cultivation, that takes place during the 17th century. A shift from copartnership and area consuming farming by fire to individualized swidden cultivation of smaller plots can be linked to the increasing pressure on woodland from ca 1550 and onwards. This was partly due to small farm colonization in the former abundant woodlands but also an increasing trend to enclose former open pasture land.
The organization of swidden cultivation in the uplands of Southern Sweden can be understood as an economic institution and analyzed with the tools of the property rights-schools. The case-studies aim to show how increased transaction costs alters the character of the organization of swidden cultivation from a joint project to an individual business. A transition from a tax system based on collective rates to individual taxation during the beginning of the 16th century can also have played a vital role. In this context, conflicts and lawsuits constitutes excellent source- material in order to understand the swidden cultivation as an economic institution from the late medieval to the end of the 17th century.

03 INVESTIGATING LATE NEOLITHIC SLASH-AND-BURN AGRICULTURE IN A TEMPERATE FOREST (FORCHTENBERG EXPERIMENT)

Author: Eckmeier, Eileen - Ludwig-Maximilians-Universität München (Presenting author)
Co-Author: Rösch, Manfred - Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart; Ehrmann, Otto - Büro für Bodenmikromorphologie und Bodenbiologie; Bogenrieder, Arno - Institut für Biologie/Geobotanik, Universität Freiburg; Gerlach, Renate - LVR-Amt für Bodendenkmalpflege im Rheinland; Hall, Mathias - Forstamt Hohenlohekreis; Hartkopf-Fröder, Christoph - Geologischer Dienst Nordrhein-Westfalen; Herrmann, Ludger - Institut für Bodenkunde und Standortslehre, Universität Hohenheim; Kury, Birgit - Büro für Bodenmikromorphologie und Bodenbiologie; Schier, Wolfram - Institut für prähistorische Archäologie, Freie Universität Berlin; Schulz, Erhard - Institut für Geographie und Geologie, Universität Würzburg
Keywords: slash-and-burn, Neolithic agriculture
Presentation Preference: Oral

The Forchtenberg burning experiment is an interdisciplinary project that was designed to test hypotheses on the use of slash-and-burn agricultural techniques during Late Neolithic for which evidence had been provided by archaeobotanical data. Since 1998, annual burning and cultivation of crops in a deciduous forest in SW-Germany resulted in a huge amount of data on crop yields and also, e.g., on the effects of fire on weeds and on soil characteristics, wood fuel and charcoal production, or necessary manpower.
The experiments compared burned and cultivated plots with unburned plots, on different soils and with different crop types. The results showed that cultivation on cleared and burned plots resulted in high crop yields, comparable to those produced by modern agriculture and ten-times higher than yields estimated for the medieval period. The crops are not contaminated with weeds and grow undisturbed. Burning was especially effective on soils with lower pH but also led to higher yields on soils of better quality. High yields were obtained only during the first year of cultivation while cropping on the same plot with, and especially without repeated burning, caused significant decreases in yields in the following years. Several effects contributed to high yields on the burned plots: high fire temperatures prevent germination of weed seeds, nutrients are mobilized from soil organic matter and wood fuel, and the dark surface of the soil increases the soil temperature which has a positive effect on nutrient mobilisation during spring. Burning is also more efficient considering manpower because no additional manuring or weed management is necessary.
Late Neolithic was the time when agriculture was introduced to areas in Central Europe which were less favourable for cropping and which had not been cultivated during earlier Neolithic periods. Slash-and-burn agriculture seems to be the method which enabled this process.

04 DIAGNOSTIC FEATURES OF SWIDDEN CULTIVATION IN SOILS OF THE TEMPERATE FOREST ZONE

Author: Dr Ershova, Ekaterina - Moscow State University, Russia (Presenting author)
Co-Author: Dr Ponomarenko, Elena - University of Ottawa, Canada; Prof Blinnikov, Mikhael - St. Cloud University, USA; Dr Vyazov, Leonid - Kazan' Federal University, Tatarstan, Russia; Ms Bakumenko, Varvara - Moscow State University, Moscow, Russia
Keywords: Palynology, pedoanthracology, phytoliths
Presentation Preference: Oral

Swidden cultivation is believed to be one of the most-geographically-ubiquitous agricultural systems in the world, spanning from the tropics to the boreal forest zone in both hemispheres. Chronologically, it has been utilized from 3rd millennium BC to 20th cent. AD. Presumably, the swidden technology should be associated with a certain social structure and settlement pattern of agricultural societies. Local technologies may vary in details, but all varieties of swidden cultivation involve deep combustion of wood, aiming to turn charcoal into ash, 2) sowing into ash with a minimal application of tillage tools, 3) short-term use of a cleared land for crops (1-5 years), and 4) a prolonged fallow stage (afforestation) required for the soil rehabilitation. Swidden agriculture is targeting a wide variety of vegetation types, developed mainly on coarse to medium-textured soils in well-drained positions. The short duration of productive stages and long pre- and post- harvesting stages of this agricultural system suggest that all areas suitable for swiddens within the temperate forest zone would be utilized by local populations rapidly, within decades. However, swidden cultivation does not require any durable implements and does not leave distinct archaeological records. Application of a novel combination of stratigraphic, palynological, pedoanthracological, and phytolith analyses in the areas adjacent to archaeological sites allowed us to reveal a specific signature left by the swidden cultivation. The paper presents first results of applying the recently developed techniques to reconstruct traces of swidden cultivation in Russian and Canadian sites located within the temperate forest zone.

05 FOREST SOIL CHARCOAL AS INDICATOR OF SLASH AND BURN CULTIVATION

Author: Tomson, Pille - Estonian University of Life Sciences; Estonian University of Life Sciences (Presenting author)
Co-Author: Prof Sepp, Kalev - Estonian University of Life Sciences; Ass. Prof Kaart, Tanel - Estonian University of Life Sciences
Keywords: soil charcoal
Presentation Preference: Oral

Slash and burn cultivation (SBC) have been practised until 20th century in northern Europe. The fire cultivation have left charcoal to the soil, but is difficult to distinguish the charcoal produced by SBC and forest fires. The aim of current study is to analyse possibilities to use the soil charcoal as indicator of location of historical SBC sites.
Fieldwork were carried out in southern Estonia at 110 study sites. 35 soil pits were dug into different types of land: arable fields, experimental slash and burn fields from 2006-2008, continuous forest land and recent forest fire sites to analyse the charcoal location in soil profile under certain conditions. Also the soil samples were studied in former 36 SBC and 34 forest sites, distribution of both types were identified by 19th century cadastral maps.
The statistical analyse showed that in recent forest fire sites and experimental SBC sites the charcoal is locating in the upper part of the soil profile. In the forest the charcoal is mixed into soil by bioturbation and in ground level is destroyed by weather. In arable fields the charcoal could found deeper in the soil because in depressions the charcoal is buried due to erosion. In burned forests the charcoal could be buried by tree uprooting. The oldest buried dated charcoal in forest soil were dated 4940 ± 50BP.
In 19th century SBC sites the charcoal were found deeper than in 19th century forest land. The upper border charcoal rich layer did not differ but were thinner in forest (mean 6.9 cm in SBC sites, 5.0 in forest, $p<0.05$). The charcoal in humus of SBC sites were dated 198±35 BP on average. Mechanisms of relocation of soil charcoal need more studies.

355 ISLAMIC ARCHAEOLOGY IN EUROPE

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Duckworth, Chloe (United Kingdom) - Newcastle University
Co-Author(s): Govantes Edwards, David (Spain) - Universidad nacional de educación a distancia
Keywords: Islamic archaeology, medieval, post-medieval, heritage
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

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Islamic archaeology – that is, the material culture of past regions under Islamic rule – is a growing field, encompassing a diverse range of periods and sites, from south-east Asia to West Africa. Yet the archaeology of Islamic sites and periods within Europe continues to occupy a tenuous space, both in scholarship and the public imagination. Perhaps this is due to the spectre of orientalism, and the 'otherness' of Islam, or it may be a result of the diversity and perceived lack of longevity of Islamic presences in Europe. The time is ripe for a reassessment of Europe's Islamic pasts, which encompass a broad range of sites and time periods, and which are significant from both an archaeological and a cultural heritage perspective. How we frame, investigate and manage our Islamic heritage is central to the sorts of questions we might ask of the material evidence, and our understanding of its relationship to history, memory and cultural heritage management. In this session we aim for a diverse range of approaches to the Islamic past of Europe, including but not limited to: reports of new archaeological work; synthetic or comparative studies; and heritage management. We hope to forge new connections between those engaged in the study or presentation of Islamic material culture in several European countries.

01 SHOOTING OURSELVES IN THE FOOT. POLITICS, ISLAM AND ARCHAEOLOGY IN EUROPE AND THE WORLD.

Author: Dr Duckworth, Chloe - Newcastle University (Presenting author)
Co-Author: Mr Govantes-Edwards, David - Universidad Nova de Lisboa
Keywords: Islam, impact, politics
Presentation Preference: Oral

The papers in this session focus on a range of time periods and places, united by their association with Islam. In this introductory presentation, we examine what the field of Islamic archaeology can offer, if anything, to a broader understanding of Europe's cultural heritage. The management of sites and their presentation to the public are central here, but equally so are the choices made by academics, of what to include, and what to omit, from the contextualisation of Islamic sites, influences and artefacts in Europe and the world.

We suggest that a lack of engagement, though originally stemming from a desire to avoid subjugating academic discourse to current political debate, has ultimately impoverished the understanding of Islamic material culture in Europe, because archaeologists are wary of touching upon these volatile issues. What is needed now, for the benefit of both academic rigour and social impact, is the embracement and presentation of complex, rather than simple narratives; more public engagement; and a certain degree of bravery! This is a call to unite, to engage with one another's points of view, and to make a noise about what we do. Our voices have never been more relevant.

02 ISLAMICATE BODIES: LOCATING MUSLIM GRAVES OF MEDIEVAL NOMADS IN THE LOWER VOLGA STEPPE

Author: Dr Shingiray, Irina - University of Oxford (Presenting author)
Keywords: Islam, Nomads, Steppe
Presentation Preference: Oral

The Archaeology of Islam, as a developing field of research, has gradually outgrown its main concern with urban contexts and art-historical approaches, and has begun embracing the notion of multiple and indigenous forms of Islam. It has become apparent that during the Middle Ages, Muslim religion, communities, and material culture were widespread in the vast territory of Western Eurasia and beyond. Large regions in the East of what is now part of geographic Europe were ruled by Islamized dynasties, such as those of the Golden Horde, the Oghuz, and arguably the Khazars before them. Some of these Islamized polities and empires which had an enormous impact on the trade, culture, art, and technology of Europe were ruled and run by nomads. However, nomadic Islam is poorly understood, and there is a widespread medieval and modern prejudice that Islam was superficial among the nomads. Although by the 10th century CE, this religion began to spread in the Lower Volga region, the extant monumental architecture of Islamic urbanism—the long-time focus of the Archaeology of Islam—does not predate the Golden Horde (Mongol) Period of the 13th-14th centuries. Before and beyond these islands of urbanism, the main archaeological source for researching Islam in the Steppe is the numerous Islamicate burials interred in kurgans. Locating Muslim graves among them, however, can be a real challenge, due to the scholarly preconceptions of what constitutes "normative" Islamic practices. By focusing on several cases of Muslim burials from the Lower Volga steppe, I argue that one needs to combine religious knowledge of indigenous Islam with cross-regional comparative research of Islamic burial practices. This helps to overcome the purist prejudice of what is normative in Islam and appreciate the wide presence and diversity of Muslim graves among medieval nomads.

03 THE VOLGA BULGARIA, THE MUSLIM CULTURAL STATE IN EASTERN EUROPE

Author: Dr. Correspond member of the Tatarstan Academy of Sciences Sitdikov, Airat - Chalikov Institute of archaeology (Presenting author)
Keywords: Bulgar, Turkic, Islamic
Presentation Preference: Oral

In 921 the Bulgar ruler (el´teber) Almysh sent his embassy to Bagdad in token of his acceptance of Islam and the Caliph' s protection, as well as of his promise of support against Khazars. It was reciprocated by the Caliph' s embassy sent to the Volga, with courtier ar-Rassi and secretary Ahmad Ibn Fadlan at the head. The latter was to become the author of the famous account of his travel known as Ahmad Ibn Fadlan' s Book. On 12 May, 922 followed the diplomatic recognition of Bulgaria as the northernmost Muslim country.
The city of Bolghar became the center of the Turkic Islamic culture. It boasted white-stone mosques and mausoleums, palaces and fountains, and numerous baths, serving to decorate its streets and squares. Like in every Oriental city, the buildings in Bolghar had underground heating, water, and sewage systems. Each of its large communities had a

school and a madrassa. By 908-922 they had started the issue of coins imitating the Samanid Muslim traditions. These coins are the invaluable source for tracing the dynasty of the Bulgar rulers, or el´teber (then emirs). The history of the Arabic script used by the Bulgars and Tatars is over a thousand years old.
So far over eighty graveyards that evidence to the Muslim burial ritual of the Middle Age have been examined. Bulgaria' s gold age is the period between the second half of the thirteenth and the first half of the fourteenth centuries that culminated in the formation (by the fourteenth century) of the new Tatar ethnic and social entity that united the Muslimized nobility.

04 ISLAMIC ARCHAEOLOGY IN RUSSIA

Author: PhD Koval, Vladimir - Institute of Archaeology RAS (Presenting author)
Keywords: Islamic archaeology, Russia
Presentation Preference: Oral

Russia - the country, a considerable part of its present territory inhabited by Muslims. Among Russian archaeologists there are also many Muslims. Already this makes the study of Islamic antiquities one of the important directions of medieval archaeology in Russia. It is very difficult problem of the division of ancient objects and items related to different religious groups (Christians, Muslims, Buddhists, pagans), especially - if they lived in the same territory. Russian archaeologists adhere to the concept of independent (off-confessional) archeology, but at the same time they are making great efforts to explore the antiquities of all confessions, including Muslims. Islamic Renaissance (up to fundamentalism) influence on the archeology of modern Islamic regions. This is a serious problem, whose solution is possible not only by political means, but also by position of archaeologists community. Islamic archeology in Russia has a lot of achievements in the study of Muslim religious architecture, urban and nomadic cultures. Big research is being conducted in many places where the preserved Islamic antiquities - in the Volga region (the Volga Bulgaria and the capitals of the Golden Horde), North Caucasus, Southern Siberia. Russian archaeologists are ready to cooperate in Islamic archeology in the territory of other countries and are invited to this cooperation on archaeological sites in Russia.

05 ACCENTUATING THE ORDINARY: CERAMICS IN EARLY ISLAMIC SICILY

Author: Ms Testolini, Veronica - University of Sheffield (Presenting author)
Co-Author: Professor Day, Peter - University of Sheffield
Keywords: Islamic everyday pottery
Presentation Preference: Oral

Archaeology has commenced a reassessment of the "Western Islamic" heritage of Europe. Such research entails not only ethical, but also methodological issues. Islamic studies have focused on Art History and Architecture, which both tend to overlook the life of "commoners". Equally, while archaeologists often use pottery as an index of people's movements and habits, research has been heavily influenced by traditional approaches to Islamic studies, with their emphasis on objects of perceived artistic and aesthetic value, judged worthy of study and collecting. This paper aims to redress the balance, giving ordinary Islamic pottery a chance to shine. It argues that an appreciation of the technology, exchange and consumption of everyday ceramics offers insight into the lives of ordinary people, understandings that go beyond those generated from text and elite material culture.

Cooking pots, table wares, storage jars and transport amphorae from three excavations in Sicily have been studied macroscopically, by ceramic petrography and by SEM-EDS. This allows the reconstruction of raw material recipes, forming methods and finishing techniques employed in ceramic production. Moreover, two assemblages from the earlier Byzantine phases have been studied, comparing the ceramics of these two culturally different periods.

It is argued that the study of total ceramic assemblages allows a better understanding of the pottery production and technology in early Islamic Sicily. The diachronic comparison of assemblages provides insight into changes in the origin and technology of pottery of the 9th-11th centuries, while also highlighting aspects of Byzantine pottery that continued into the Islamic period. Marked changes in the importation of transport jars and other vessels are revealed, in addition to local production locations during this time of change. In addition, the exchange and imitation of common pottery types within Islamic Sicily challenges our simplistic assumptions of economic and political boundaries within the island.

06 WATER AND FIELDS IN AL-ANDALUS

Author: Prof. Malpica Cuello, Antonio - Universidad de Granada (Presenting author)
Keywords: Agriculture, irrigation, al-Andalus
Presentation Preference: Oral

The aims of this paper is to discuss about the relation between water and soils in the agricultural development in al-Andalus. The start point is the concept of agroecosystem and the classification of different types of agroecosystems prevailing in the Middle Ages. Irrigation was the main form of cultivation in al-Andalus, but the irrigated agroecosystem also participated in other forms of exploitation of natural resources.

07 ARCHAELOGICAL PERSPECTIVES ON THE RELATIONSHIP BETWEEN POLITICAL ELITES AND RURAL COMMUNITIES IN AL-ANDALUS

Author: Prof García Porras, Alberto - Universidad de Granada (Presenting author)
Keywords: Poder, Comunidades Rurales
Presentation Preference: Oral

The project "Poder y Comunidades Campesinas en el reino nazarí (ss. XIII-XV)" (HAR2015 66550-P) has increased our knowledge on the relationship between the political superstructure and rural communities in al-Andalus through the examination of the archaeological record. This knowledge will allow us to analyse the evolution of settlement patterns and material culture in al-Andalus, an Islamic polity in a European context, both comprehensively and diachronically.

08 ISLAMISATION AND GENDER: VIEWING WOMEN AND FEMALE ACTIVITIES IN THE SHAPING OF SOCIETY IN AL-ANDALUS

Author: Mr Herran Subinas, Mikel - UCL Qatar (Presenting author)
Keywords: Islamisation, Gender, Women
Presentation Preference: Oral

After the conquest of Iberia in the 8th century, the arrival of Arab and Berber tribes transformed what would become the Andalusian society through the spread of fragmentary social divisions, a tribal system, and a common new religion. Changes brought to the Peninsula have been often studied through the introduction of new technologies or crops and a certain in almost revolutionary processes. However, we see that aspects that have been considered at the core of Andalusian, or even Islamic, societies, are not so self-evident and direct. This paper looks at how ideas of gender and notions such as intimacy or sexual division of labour developed in the first centuries of Islamic presence in the Iberian Peninsula, in an attempt to shed light to a large collective that has often been bypassed in Islamic Archaeology. By looking at how understandings of femininity and female roles changed between the 8th and the 11th century in Al-Andalus, we pursue a different perspective into the social changes brought by Islam in the European continent.

09 OTTOMAN ARCHAEOLOGY IN THE EUROPEAN CONTEXT: AN ISLAMIC ARCHAEOLOGY OR NOT?

Author: Dr. Dikkaya, Fahri - TED University (Presenting author)
Keywords: Ottoman, Europe, Islam
Presentation Preference: Oral

Islamic archaeology is concerned with the archaeological investigation of Islamic societies and their people's material cultures by scholars working in this area. However, how can the non-Muslim members of the society and their archaeologies be identified in an archaeological project related with what we called Islamic archaeology? In this context, how can we define the archaeology of multi-national and multi-religious Empires governed by Muslim sultans, such as the Ottoman Empire? The Ottomans governed the European lands from Slovakia to the Aegean Sea for the centuries, and left their heritage in these lands. In the European part of the Ottoman Empire, the population was generally Christian. Should the archaeology of a non-Muslim village or settlement dated to the Ottoman period be identified as Islamic archaeology because of their Muslim governors? Otherwise, is it accurate to identify archaeological studies through religious contexts? This paper aims to discuss Ottoman archaeology in Europe and its problematic identification within the Islamic archaeology.

356 MOBILITY AND MIGRATION IN MORTUARY ARCHAEOLOGY: METHODS OF INVESTIGATION AND THEORIES OF ASSESSMENT

Theme: 6. Interpreting the archaeological record
Author: Kalenderian, Vana (Netherlands) - Rijksuniversiteit Groningen
Co-Author(s): Moore, Joanna (United Kingdom) - Durham UniversityDijkstra, Tamara (Netherlands) - Rijksuniversiteit Groningen
Keywords: Burials, Migration, MaterialCulture, Osteoarchaeology, Isotopes
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Current global circumstances have reignited debates in broader society on issues of migration, cultural interaction and social integration. Now more than ever, the subject of population movements has come to the forefront of social, political and academic discussions. However, this is not a modern phenomenon. Mobility has always been an integral part of human history. The goal in this session is to come closer to an understanding of migration in antiquity, the reasons behind it, and the effects that it had on the societies and individuals involved.

Our discussion will centre on the contextual analysis of the mortuary record. Governed by cosmological rules and socio-cultural principles, the act of burial is closely linked to group consciousness and identity. It also serves as a platform for the display of status and power, which may reflect social, economic and political change. The funerary evidence thus provides unique insight into population clusters, and can help identify changes associated with different types of migration and cultural exchange.

By bringing together researchers in this field, the aim is to present the various techniques implemented in answering questions of mobility. Both scientific and theoretical approaches will be discussed. These include osteoarchaeology, isotope analysis, and assessments of the material culture. By highlighting the contributions of each method, yet also shedding light on their individual limitations, the main emphasis of this session will be on how a shift towards multidisciplinary research within mortuary archaeology can contribute to producing a holistic understanding of migration and mobility in the past.

01 HIGH-SPATIAL RESOLUTION INTRA-TOOTH SR-ISOTOPE ANALYSIS OF A MODERN MIGRANT - HOW DOES A RAPID RELOCATION MANIFEST IN HUMAN TOOTH ENAMEL?

Author: Montgomery, Janet - Durham University (Presenting author)
Co-Author: Beaumont, J. - University of Bradford; Nowell, G. - Durham University
Presentation Preference: Oral

Strontium isotope analysis (87Sr/86Sr) of archaeological humans is widely used to investigate geographic origins. Whilst recent work suggests the petrous or any calcined bone can retain biogenic ratios, Sr-isotopes have typically been obtained from tooth enamel. The c. one year duration of human enamel maturation, the period of crown mineralisation, body residence time of Sr and bulk sampling of enamel all contribute to a ratio that is a weighted average of a multiplicity of inputs over possibly several years. By measuring sequentially mineralising teeth diachronic information about childhood residence may be obtained but higher resolution intra-tooth sampling by laser ablation has been attempted in the hope that decreasing the sample size will increase the temporal resolution of the data. However, whilst this technique may discriminate between samples in old and highly variable geological regions such as Africa, the low precision of the data can mask biogenic variation in regions of low Sr-isotope variability, which are found across much of northwest Europe. Here we present Sr-isotope data of a deciduous molar from a modern child who migrated on a known day between two different Sr-isotope regions whilst the enamel was mineralising. The tooth was sampled by micro-drilling and the Sr-isotope ratios measured by TIMS. This combination of techniques produces data of equivalent spatial resolution to laser-ablation sampling but far higher accuracy and precision. The results show that an abrupt relocation does not manifest as a step change in enamel and

erroneous conclusions regarding residence and relocation may be reached if the data are interpreted without an understanding of the patterning and duration of tooth enamel mineralisation.

02 IN OR OUT? MULTI-PROXY APPROACH TO MOBILITY AND LANDSCAPE USE IN ARCHAEOLOGICAL CONTEXTS.

Author: Dr Snoeck, Christophe - Vrije Universiteit Brussel (Presenting author)
Co-Author: Mr de Winter, Niels - Vrije Universiteit Brussel; Ass. Prof Goderis, Steven - Vrije Universiteit Brussel; Ms Annaert, Henrica - Vrije Universiteit Brussel; Ass. Prof Schulting, Rick - University of Oxford; Prof Lee-Thorp, Julia - University of Oxford; Dr Fernández-Crespo, Teresa - University of Oxford; University of the Basque Country; Prof Claeys, Philippe - Vrije Universiteit Brussel
Keywords: Mobility, Isotope ratios
Presentation Preference: Oral

Understanding mobility and landscape use in past populations remains one of the key aspects of archaeological research. Different approaches have been developed through the years to gain a better understanding of how animals and humans moved across the landscape and why. Integrating archaeological records with structural, elemental and isotope analyses of animal and human remains offers new insights into these issues.

This paper briefly summarizes the latest advances in the field of structural, elemental and isotope research on animal and human bone and teeth in the frame of mobility through infrared and x-ray analyses as well as trace elements concentrations and different isotope systems (C, O, Sr). These will then be illustrated with several case studies from sites in Belgium, UK and Spain on both unburned teeth and cremated bone. The results show that each site is different, with different parameters providing a better understanding of mobility both in time and space. In Northern Spain, combining strontium concentration and strontium isotope ratios provides crucial information for comparing individuals buried in caves or in dolmens. In Broechem, Belgium, combining radiocarbon dates and strontium isotope ratios provide useful information on changes in mobility over time. Finally, at Stonehenge, UK, strontium concentration and isotope ratios, together with carbon isotope ratios on the carbonate fraction of cremated bone show how the local population differs from those identified as outsiders.

Through these three case studies, the importance of multi-proxy analyses will be highlighted and discussed.

03 STRONTIUM ISOTOPE ANALYSIS: MAXIMIZING THE RESULTS OF MIGRATION STUDIES

Author: Ms Panagiotopoulou, Eleni - Groningen Institute of Archaeology (Presenting author)
Keywords: strontium, migration, Greece
Presentation Preference: Oral

Studying migration in Early Iron Age (EIA, 11th-7th c. BC) is challenging due to the lack of substantial archaeological evidence. Furthermore, migration and the impact on each society can be interpreted in various ways depending on the period and conditions we examine. The EIA cemeteries that have been excavated in the area of Pharsala in Thessaly, Greece showing a smooth transition from the collapse of the Mycenaean Civilization are excellent case studies to investigate population movements. For the study of these cemeteries I have employed the strontium isotope analysis of tooth enamel to examine whether foreigners were buried in these cemeteries; this analysis indicated the presence of non-local individuals. However, further interpretation of these results is needed to make inferences on population movements and how these have contributed to social and cultural developments in the EIA. In this paper I discuss the difficulties that I have encountered while investigating EIA population movements and I argue that a sole analysis can only provide limited information. In order to understand patterns of migration we need to integrate different types of analysis; this should be a prerequisite for such an archaeological question.

04 ANYWHERE THEY ROAM: MOBILITY HISTORIES OF YOUNG INDIVIDUALS FROM MEDIEVAL LEPROSARIA.

Author: Filipek, Kori Lea - Durham University; Transylvania Bioarchaeology (Presenting author)
Keywords: leprosy, bioarchaeology, isotopes
Presentation Preference: Oral

Leprosy is one of the few specific infectious diseases that can be studied in palaeopathology due to its characteristic debilitating and disfiguring skeletal changes. Leprosy has been, and continues to be, one of the most socially stigmatising diseases in history, over-riding all other aspects of social identity for the sufferers and frequently resulting in social exclusion. This study examines the stable isotopic evidence of mobility patterns of children, adolescents, and young adult individuals with the lepromatous form of leprosy in Medieval England (10th – 12th centuries AD) to assess whether the individuals buried with the disease were non-locals, possibly from further afield. Enamel samples from 19 individuals from the St. Mary Magdalen Leprosy Hospital, Winchester (UK) and were selected for strontium (87Sr/86Sr) and oxygen (δ18O) stable isotope analysis based on age at death (<30 years), the presence of bone changes associated with lepromatous leprosy, and the underlying geology of their burial locations. The results from these data indicate that the St. Mary Magdalen Leprosy Hospital received an almost equal mixture of local and non-local individuals from further afield, including early pilgrims. At present, the St. Mary Magdalen Leprosy Hospital is the earliest dedicated leprosaria found within Britain and can help elucidate and test some of the broader historical notions and identities associated with the movements of those infected with the disease in Medieval England.

05 TALES OF BRONZE AGE WOMEN

Author: Professor Frei, Karin Margarita - National Museum of Denmark (Presenting author)
Keywords: Female mobility, Strontium
Presentation Preference: Oral

The Nordic Bronze Age (1.700 – 500 BC) has left us with vivid cultural remains in the southern Scandinavian landscape by, among others, the numerous burial mounds, votive depositions and rock carvings. But beyond these impressive cultural remnants, Denmark possesses the unique collections of exceptionally well-preserved human remains, the well-known oak-coffin people. These individuals, both men and women, represent the elite of their time during a crucial prehistoric period where today's society started to take shape. Recent cross-disciplinary investigations made on the most iconic of these oak coffin finds, "The Egtved Girl", revealed the first evidence of repeated long distance travels

and rapid mobility. But was the Egtved Girl an exception, or did other elite women also travel as much? This paper presents a new research project entitled "Tales of Bronze Age Women" that aims at investigating female mobility to potentially shed light on female identity and their potential roles in the Nordic Bronze Age society.

06 MOBILITY AS SOCIAL CONSTRUCT. NETWORK APPROACHES TO THE STUDY OF SOCIAL IDENTITIES AND MOBILITY OF BRONZE AGE WOMEN.

Author: Felding, Louise - Aarhus University; VejleMuseerne (Presenting author)
Keywords: Networks, Identities, Gender
Presentation Preference: Oral

Recent scientific isotopic analyses of artefacts and human remains have given us a new understanding of long distance movement in the Bronze Age (Ling et al., 2014; Frei et al., 2015; Kristiansen and Suchowska-Ducke, 2015; Varberg et al., 2016). We know that goods, artefacts and people travelled over long distances, and the routes of travel are becoming clearer.
The aim of this paper is to highlight the social implications of these networks and try to understand these in relation to the political and economic networks that existed in the Early Bronze Age.
The basis for this study is the mortuary record of the female oak-coffin burials from present day Denmark and Northern Germany from the period 1500 – 1100 BC (corresponding to the Early Nordic Bronze Age period II and III).
A social network strategy is applied, where gendered social roles and identities are investigated in relation to mobility. The hypothesis is that personal artefacts and objects carry information regarding function, gender, status and identity. Therefore such objects can be viewed as nodes of connections between related people and regions implicating routes of travel and movement within a formalized network (Jockenhövel, 1991; Sørensen, 1997; Bergerbrant, 2005).
The use of network analysis allows for the study of mobility and networks from the point of view of the social relations involved. By applying social network strategies on a multi-scale level, it is the hope to achieve a more nuanced understanding of Bronze Age society and the social role of women therein.

07 "MYCENAEANS IN THE EAST?": LATE BRONZE AGE BURIAL GIFT ASSEMBLAGES OF THE SE AEGEAN

Author: Ozturk, Huseyin - American School of Classical Studies at Athens; University of Cincinnati (Presenting author)
Keywords: Mycenaean LBA Burial
Presentation Preference: Oral

One of the key questions of the Aegean Bronze Age studies has been the extent of the Mycenaean influence in the SE Aegean, namely, the Dodecanese, the eastern Aegean islands, and the coastal Asia Minor. How should one interpret the appearance of the formerly-absent Mycenaean-style material culture in this region? Socio-cultural impact of the Mycenaeans, a limited Mycenaean political presence, the local élite's emulation of Mycenaean ways or a large scale Mycenaean ethno-linguistic presence? Naturally, in the ever theoretical discipline of Aegean prehistory, the question is one of scholarly inclinations as much as it is one of an evaluation of archaeological contexts.

In this regard, burials present us with an invaluable opportunity in that, both in terms of their architecture and the presents left in them, burials tend to be more conservative than other archaeological contexts. Looking at LH IIIA and B mortuary evidence, specifically through an assessment of burial gift assemblages, this paper will attempt to describe the nature of the Mycenaean material culture in this important region, which lies in between the Mycenaean (Ahhiyawan?) and Hittite cultural spheres. A theoretical framework will also be proposed regarding burial assemblages, with which one could assess the role of human mobility in a particular region and time period.

08 THE EVIDENCE OF ETHNO-CULTURAL INTERACTION IN THE BURIAL PRACTICES (NECROPOLIS IPKULSKY, TOBOL, WEST SIBERIA)

Author: Mrs. Chikunova, Irina - Institute of the problems of Northern development, SB RAS (Presenting author)
Keywords: migration, funerary rite
Presentation Preference: Poster

The interesting and very complicated ethnic and cultural situation has developed on the Tobol region in the period of transition from the early iron age to the middle ages. It is particularly noticeable in the funeral traditions of one of the necropolis.
We investigated burials in the Ipkulskiy burial mound that have common features: shape, depth and orientation of burials, the presence of various items, inhumation or Cenotaph. The burial vary according to the method of burial and nature of grave goods.
We investigated the burial on the back, on the abdomen, single and collective, the secondary. The population of Sargatka and the local culture buried their dead in the graves on the back. The ceramic pots, jewelry and weapons were placed in the graves. In the Era of the great migration, changes in political, economic and climatic conditions the representatives of other cultures were buried in the same burial ground. Apparently, multicultural population kept close friendly relations with the local aborigines and with each other. We have unearthed the ceramic pots and things of Karymsky, Bakalsky, Kushnarenkovo, Sargatka and local "Ipkulsky" cultures in the same burial or the grave mound. Thus, we can reconstruct the ethnic and cultural situation in the IV-VI centuries a.d. in the southern taiga of Tobol region.
We also explored several settlements around Ipkulcky necropolis, which left a mixed population.

09 PERFORMING DEATH IN ABDERA: NEW COMERS FROM KLAZOMENAI AND TEOS

Author: Prof. Dr. Hürmüzlü Kortholt, Bilge - Süleyman Demirel Unv (Presenting author)
Keywords: Klazomenai, Teos, Abdera
Presentation Preference: Oral

Results of research and excavations in recent years in Ionia allow us construct the "mortuary practices" and their effect on "intercultural relations" and "memory" of the Ionian communities. Studies of the grave offerings, burial types and anthropological analysis of the human remains provided important information on diachronic changes in burial customs and thus reflect aspects of the ancient Ionian society. Comparisons of the evidences from Ionia is important to understand the power of symbolism in mortuary practice, which lasts even after political, structural, religious and societal changes.

The mechanism of mortuary practices in general and how this mechanism worked in Ionia and the Ionian communities outside of the region, will be the subject of this paper. We will find the opportunity to compare the evidences from two mother cities Klazomenai, Teos and Abdera; and discuss how the burial rites transferred from mother cities to their colonies and shifting the cultural relationships of these settlements during the Archaic Period in the burial practices.

10 WHEN COLONISTS DIE: ASSESSING THE IMPACT OF MIGRATION ON BURIAL PRACTICES IN ROMAN GREECE

Author: MA Dijkstra, Tamara - University of Groningen (Presenting author)
Co-Author: MA, MSc Moles, Anna - UCL
Keywords: Mortuary Practices, Colonization
Presentation Preference: Oral

After the battle at Actium both Knossos on Crete and Patras in the Northwest Peloponnese were colonized by Augustus. Despite similarities in the process of colonization of these two poleis, research has shown that there are some striking differences in the development of the colonial communities. Changes at Patras were swift and profound, as demonstrated by the installation of a Roman political elite, Roman deities and the imperial cult (Rizakis 2009); an overwhelming use of Latin in public and private inscriptions (Rizakis 1998); and the introduction of Italian architecture and styles in the public, domestic, and funerary spheres (Greco (ed.) 2009). At Knossos the adoption of Roman practices and material culture was more gradual and selective, with, for example, investment in Roman monumental public architecture from the 1st-4th centuries AD, Latin inscriptions being introduced in certain spheres but a general predominance of Greek (Sweetman 2007), and the use of both local and imported pottery but with the popular Italian sigillata not appearing until late in the Augustan period (Baldwin Bowsky 2011). Most notably, while monumental funerary architecture is introduced and a great variety of tomb types are present at both sites, the concurrent burial practices are quite different, with a rapid increase in cremation at Patras, compared to the continuation of exclusively inhumation at Knossos.
In this paper we assess if and how the mortuary record in the two colonies was affected by colonization and migration, and second, to come closer to an understanding of what made the colonists of Patras and Knossos choose differently regarding burial practices, in either adhering to their home practices or adapting to their new surroundings.

11 DEATH OF A SOLDIER: FUNERARY PRACTICES AND MILITARY IDENTITY IN THE ROMAN NEAR EAST

Author: Dr. de Jong, Lidewijde - University of Groningen (Presenting author)
Keywords: Rome, tombs, military
Presentation Preference: Oral

This paper discusses the vexed issues of military and ethnic identity in the burial record. Soldiers of the Roman army and their families moved en mass across the Roman world and often died far away from their place of origin. They were drawn from all corners of the Empire and represent a multi-ethnic group. Confronted with different mortuary rituals of the local population, as well as possible new building materials, coffin types, and ritual artifacts, how did the migrant community of soldiers choose its burial rites? Did each soldier maintain the traditions of his own homeland, did they copy the practices of the resident local population, or, instead, did they develop a new type of burial and commemoration that stressed their membership in the military? What choices were made for the burial of veterans and civilian family members of the soldiers? These questions have rarely been investigated for the Roman Near East, which has a rich, though heavily fragmented, material record of funerary practices of civilians, soldiers, and veterans. The paper discusses a number of case studies from Syria and Lebanon, including Palmyra and Bosra. It illustrates the difficulties of identifying military tombs, as well as the strong differences that existed between the burial of veterans and active soldiers. The study of the latter group demonstrates the emergence of a military identity in the mortuary record.

12 CONSIDERING NON-LOCAL PRACTICES: THE CASE OF A CREMATION BURIAL FROM ROMAN BEIRUT

Author: Ms. Kalenderian, Vana - Rijksuniversiteit Groningen (Presenting author)
Keywords: Cremation, Roman, Lebanon
Presentation Preference: Oral

Established as the first Roman colony in the Near East, the city of Berytus (modern day Beirut, Lebanon) witnessed an influx of Roman army veterans who with them brought foreign customs and traditions. While the study of burials from Beirut continues to shed light on the socio-cultural aspects of Roman Berytus as well as the changing mortuary practices of the period, this paper will focus on a case study regarding a cremation burial found in a burial ground on the outskirts of the city. Consisting of a practice that was no longer common among the local population, this burial suggests the presence of either a foreign settler or a newly adopted custom. By considering the osteological, chemical and archaeological data, the cremated remains and the associated grave furnishings will be discussed with the aim of unraveling the identity of the individual encapsulated within the urn.

357 ARCHAEOLOGY ON SALE: HOW TO PREVENT OFFICIAL SELLING OF ILLEGALLY EXCAVATED OBJECTS?

Theme: 2. The Valletta Convention: the next 25 years
Author: Mödlinger, Marianne (France) - Université Bordeaux Montaigne
Co-Author(s): Fernández-Götz, Manuel (United Kingdom) - University of EdinburghČrešnar, Matija (Slovenia) - University of LjubljanaKairriss, Andris (Latvia) - Latvian Academy of Culture
Keywords: trafficking, selling of cultural material
Presentation Preference: Round table

This year's Round Table of the Committee on the Illicit Trade in Cultural Material focusses on the selling of archaeological objects at auction houses and antiquity dealers in Europe. Though several objects demonstrably have a more than doubtful provenance, they can be sold, or, if withdrawn from the auction, sold later on without much consequences or confiscation.
We would like to discuss different strategies how to reduce such practice, and shed also light on the role of archaeologists in this field:
- how much do we as archaeologists contribute to such sales (for instance as experts for auction houses),
- how much do we as archaeologists act against it?

Another important point is the practice of museums, or the archaeologists in charge for the museums, to buy such items directly from the dealer, or the auction house itself.

This is congruent with our statute on 'Commercialisation':
- raise public awareness of the legal consequences of the damage and destruction of cultural heritage, and the resulting loss of information;

- report any illegal activity, or trade of potentially illegally-acquired material culture;
- never act as an expert or advisor for auction houses, antiquaries, or private collectors if the object or collection of objects concerned are not going to be part of a collection open to public and research, and does not have a legitimate provenance;
- contribute in any form to discourage commercialisation of archaeological material.

01 PROTECTION OF LATVIAN ARCHAEOLOGICAL ARTIFACTS: STATUS QUO AND SOLUTIONS

Author: Mr. Kairiss, Andris - Latvian Academy of Culture (Presenting author)
Keywords: Archaeological heritage protection
Presentation Preference: Oral

Latvia is rather small country, however its archaeological heritage is rich. Although statistical data regarding illegal obtaining of archaeological artifacts in the country is relatively limited, the volumes of illegal trade of Latvian antiquities in the Internet allow for a conclusion that large number of national archaeological artifacts is involved in the illegal circulation.

Presentation will address Latvian situation and solutions (methodological, technical, legal and other) for prevention of and fight against illegal obtainment and trade in archaeological artifacts and other cultural heritage objects. Attention however will be paid also to the aspects of international cooperation and information exchange, as the protection of national cultural heritage within own country is in fact impossible in ever globalizing world.

02 ILLICIT TRADE AND FORGERY: KEY FOR UNDERSTANDING CULTURES?

Author: Prof. Salvadori, Monica - University of Padua - Department of Cultural Heritage (Presenting author)
Co-Author: Dr. Baggio, Monica - University of Padua - Department of Cultural Heritage; Ms. Bernard, Elisa - University of Padua - Department of Cultural Heritage; Mr. Zamparo, Luca - University of Padua - Department of Cultural Heritage
Keywords: Forgery, collections, trade
Presentation Preference: Oral

In December 2015, the University of Padua received, as a donation, the archaeological collection of Bruno Marchetti, an Italian lawyer who was an avid collector of classical art items. To date, we have just begun the study of the artefacts, starting with the analysis of the core of Greek figurative vases (157 pieces). Two things are worth pointing out: first, we do not have any documents regarding how the Marchetti collection came to be or where its items came from; and second, from a first naked-eye survey of the items, there seem to be quite a few pieces of dubious origin. Therefore, in starting their scientific analysis, we are entering into two controversies: the "status" of collection artefacts and their informative potential as historical sources; and the problem of archaeological forgery. On the first hand, it is clear that studying collection pieces allows us to appreciate the scope of contemporary artefact circulation, to better analyse the problem of source areas and to increase the sample catalogue of shapes and iconography. On the other hand, only a multi-disciplinary approach will allow us to distinguish authentic items from forgeries. This approach will range from archaeometric techniques to traditional comparative archaeological analysis, based on visual evaluation and imaging techniques. Moreover, the forged artefact is a valuable source of information regarding the knowledge, tastes, techniques, art market dynamics and epistemological and axiological values at the time of its creation. Therefore, private collections and forgeries could be the key to understanding (and, maybe, fighting) the current widespread phenomena of forgery and illegal trade of the cultural heritage, maybe even thanks to the implementation of a database that, starting from Italy, could one day spread to embrace Europe as a whole.

03 THE LEGAL POINT OF VIEW - PROPOSALS FOR DUE DILIGENCE OBLIGATIONS IN THE ART MARKET

Author: Mrs. Weiler-Esser, Julia - HerA - Heritage Advisors; Ruhr Universität Bochum (Presenting author)
Keywords: Due diligence, Law
Presentation Preference: Oral

How to prevent official selling of illegally excavated objects?
As concluded by an evaluation of the prior legislation, Germany could have been considered a hub for dealers with illicitly excavated or unlawfully imported goods. In 2016 the German legislator planned to address this gap by revising the law. The new German "Act on the Protection of Cultural Property" came to the following solution: Only legally exported objects can be legally imported – and legally sold. For all these steps, there has to be some kind of evidence. Without these documents, archaeological goods cannot be sold anymore (at least if they were imported after 2007, the day Germany first implemented the UNESCO 1970 convention into German law). Each object has to have some kind of provenance, or at least a proof it has been in Germany before 2007. This paperwork has to be checked by each auction house or antiquities dealer before a sale. Consequently, some objects became virtually unsellable.
The new Act took effect in July 2016. His success depends on many variables, to a great extend also on the contribution of dealers, archaeologists, judges and law enforcement. Other State Parties to the UNESCO 1970 Convention (131 States worldwide) found other solutions, equally depending on the cooperation of all stakeholders and professions involved in the business.

This contribution aims to present the legal aspect of the question "how to prevent the selling" and to introduce different legal options and measures from several European UNESCO State Parties. A topic for discussion could be, to discuss which of them could become part of due diligence obligations for dealers, archaeologists and museum curators. Examples for good cooperation between archaeologists, lawyers and art dealers will be examined to shed light on this question also from a legal point of view.

04 COMMITTEE ON THE ILLICIT TRADE IN CULTURAL MATERIAL: RECENT ACTIVITIES

Author: Dr Mödlinger, Marianne - IRAMAT-CRP2A Université Bordeaux Montaigne (Presenting author)
Co-Author: Dr Črešnar, Matija - University of Ljubljana
Keywords: illicit trafficking, auctions
Presentation Preference: Oral

We will focus on the activities of the Committee on the Illicit Trade in Cultural Material during the last months and how we can improve our actions against trafficking of cultural material. A main point will be the role of archaeologists in the selling of such material: how much do we contribute (for instance as experts for auction houses), and how much do we really act against it? Another point of discussion is the practice of museums, or the archaeologists in charge for the museums, to buy such items directly from the dealer, or the auction house itself.

358 CULTURAL FRONTIERS – ECOLOGICAL FRONTIERS: NEW APPROACHES TO THE BORDERLANDS OF OPPOSING SOCIETIES IN THE LAST TWO MILLENNIA

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Pluskowski, Aleks (United Kingdom) - University of Reading
Co-Author(s): García-Contreras Ruiz, Guillermo (Spain) - University of GranadaBanerjea, Rowena (United Kingdom) - University of Reading
Keywords: Frontiers, borders, multiculturalism, historical, landscapes
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

MERC
Medieval Europe Research Community

Borders served to secure land, resources, and in some cases populations, and in the last two centuries they have been integral to the construction of national identity. Anthropologists have demonstrated how borders, and specifically frontiers – the spaces across the border – have resulted in differential national, ethnic and gender identities, inflected in a way that distinguishes them from political heartlands. The multicultural character of frontiers, exemplified by both mobility and fixity, disrupts the process of state formation and cultural homogenisation. As a result, the frontier is the focus of multiple and competing meanings, which states seek to control through the symbolic encoding of space. When frontiers are created between politically opposed societies, they may become contested and volatile spaces.

The historical development of Europe over the last two thousand years is defined by frontier societies. But to what extent were frontiers naturally pre-determined? What role did mountains, hills, rivers, lakes, deserts and expanses play in shaping borderlands? Did cultural and ecological frontiers map onto each other? How was a frontier landscape organised and used in contrast to more central regions? This session invites new perspectives on Late Antique, Medieval and Post-Medieval frontiers in Europe and beyond, particularly those involving new or integrated methodologies and those which challenge older models, including the traditional core-periphery paradigm.

01 'CORE' AND 'PERIPHERY' IN THE EVOLUTION OF EARLY MEDIEVAL TERRITORIES: A CRITICAL EXAMINATION FROM A PROPERTY RIGHTS PERSPECTIVE

Author: Dr Oosthuizen, Susan - University of Cambridge (Presenting author)
Keywords: property, landscape, periphery
Presentation Preference: Oral

Archaeologists and historians of early medieval England have tended to explain territorial origins in terms of political control that expanded from a 'core' area, containing settlement and arable fields, into and across a surrounding, uncultivated 'periphery'. Cores were characterized by strong political control and clear rights of private property; while property rights in peripheral zones were weak or non-existent. As the area and dominance of some stronger political units expanded at the expense of those that were more vulnerable, their control over the periphery became increasingly clearly defined and territorial boundaries were eventually established across them.
The paper suggests two difficulties with that model. First, its lack of clarity in whether/how the periphery was exploited under rights of property. The argument develops and explores two hypotheses to resolve that problem:
(a) that peripheral zones were not subject to any rights of property. That is, there were null or public property rights in those non-arable resources; OR
(b) that those with holdings in core settlements held shared rights of exploitation in the pastoral resources of the periphery, but such rights were inferior in their defensibility to the rights of private property that characterized areas of core settlement.
The second problem with the model is its assumption that, as its distance from the area of core settlement increases, the value of a resource to that community decreases.
The argument concludes that the model is fundamentally flawed, since there were few 'peripheral' areas in early medieval England in which there was so little competition for resources that property rights were non-existent and could gradually emerge. It further concludes that the distance from settlements of their non-arable resources is unlikely to have diminished their value to those to whose subsistence they made an important contribution.

02 DEPOPULATION, COLONISATION AND THE ENVIRONMENTS OF MEDIEVAL EASTERN BALTIC FRONTIERS

Author: Dr. Pluskowski, Aleks - University of Reading (Presenting author)
Co-Author: Dr Brown, Alex - University of Reading; Dr Banerjea, Rowena - University of Reading
Keywords: Medieval, Baltic, Landscape
Presentation Preference: Oral

The crusades which resulted in the creation of the Christian polities of Livonia and Prussia by the end of the thirteenth century, saw the establishment of a series of shifting frontiers. The principle social indicator of stability was a sustained process of colonisation, which was particularly pronounced in Prussia. Here the eastern frontier with the Grand Duchy of Lithuania became fixed for almost two centuries, defined by a comparatively depopulated landscape. However, human activity did not completely disappear with the survival of native communities along with the presence of military installations and their provisioning networks. This is evident from a combination of archaeological and written sources, but is further supported by evidence for human impact on vegetation and landuse in the surrounding landscape. This paper, drawing on the results of the Ecology of

Crusading project, explores the ecological definition of a frontier in relation to diachronic changes in human activity and relative levels of biodiversity in the eastern Baltic. It considers whether the east Prussian frontier was typical for the Baltic crusader states, and to what extent the societies and landscapes encountered by the conquering regime affected the extent and character of the frontiers of medieval Livonia and Prussia.

03 LOOKING FAR BEYOND MEDIEVAL TIMES: BORDERLAND SHAPING IN NORTH-EASTERN ITALY

Author: Doctoral Researcher Saccoccio, Fabio - University of Nottingham (Presenting author)
Keywords: Italy, longue-durée, frontiers
Presentation Preference: Oral

Rivers in lowlands always had the peculiar role of being communication ways and/or natural borders. North-eastern Italy allows to analyse a peculiar case in which cultural and natural frontiers match in a single feature, the Mincio river. Such river today represents the current regional border between Lombardy and Veneto.
Nevertheless, this peculiar frontier zone results deeply affected by phenomena of interaction between human groups far beyond recent times. At the time of Frederick Redbeard, this was the border between the Kingdom of Italy and the Kingdom of Germany, while it was not recognised as a limit in Augustus' regiones in the I century BC.
However, multiple archaeological evidence seems to relate the origin of this long-lasting frontier limit to the Iron age, when a complex range of interaction pattern is outlined and the frontier itself seems to shift from hard to fluid as effect of a changing regional geo-political pattern.
Aim of this contribution will be the evaluation of such area, bringing to light its role through time.

04 A LONG-LASTING FRONTIER IN CENTRAL ITALY.

Author: Full-time Researcher Citter, Carlo - University of Siena (Presenting author)
Keywords: inner frontiers, resilience
Presentation Preference: Oral

In southern Tuscany there is a watershed between two rivers (Ombrone and Albegna). It runs From the top of the Amiata mountain to the Thyrrenian sea. Unlike many other similar geographical settings, this one played a key role as a political boundary from the 6th c. BC to the 18th c. AD. But local dialects are still rather different even today. This paper focuses on this special, often neglected frontier that seems to be resilient over time. We wish to stress the need to study inner frontiers too. They are rooted in the geographical conditions, but geography cannot explain, why did they resist to any consistent change from the Etruscan period to the Roman empire and up to the fragmented Middle ages. They are less evident than major ones, but they can be as effective have the same impact on jurisdictions, trades, cultural relationships.

05 EVALUATING THE IMPACT OF MULTICULTURAL FRONTIERS IN MEDIEVAL IBERIA: MOLINA DE ARAGON AND ITS HINTERLAND AS A CASE STUDY

Author: Dr Garcia-Contreras Ruiz, Guillermo - Universidad de Granada (Presenting author)
Co-Author: Dr Banerjea, Rowena Y. - University of Reading; Dr Fry, Rob J. - University of Reading; Dr Hayward, Kevin - Pre-Construct Archaeology ltd.; Dr Brown, Alex D. - Wessex Archaeology; Dr Pluskowski, Aleks G. - University of Reading
Keywords: Medieval, Frontiers, al-Andalus
Presentation Preference: Oral

This paper deals with the importance of frontier studies in medieval archaeology and discusses the applicability of a range of scientific archaeologically methodologies for a better understanding of both cultural and ecological human relationships. We focus on the medieval period in central Iberia, showing the first results of a project that is in its early development, focusing on the castle of Molina de Aragon and its hinterland. The Middle Ages in Central Iberia are marked by a series of conquests which saw the reorganization of Visigothic Kingdom into Islamic polities., which in turn were incrementally annexed by north Iberian Christian monarchs. Subsequently, a borderland developed between the two most powerful medieval kingdom of Iberia, Castile and Aragon. This part of Iberia represents an exceptional area for investigating the dynamics of frontiers, colonisation and social reorganisation during the Middle Ages, mainly when the political control of territory fluctuated between Islamic and Christian authorities. The centre of power in the region consisted of a fortified complex, located on a hill overlooking the valley of the River Gallo in the Upper Tagus. During the last years a range of archaeological investigations were conducted: a series of small-scale excavation were undertaken within and around the sites, mostly to take geoarchaeological samples and obtain a preliminary understanding of the site's historical evolution. Secondly, a geophysical survey across the entire castle was carried out. Lastly, a general prospection of the site's hinterland has been carried out with the aim of selecting sites suitable for futures palaeoenvironmental analyses, to take mortar and fabric samples to be compared with the architectural phases identified in the capital of the county, and to undertake an analysis of the network of settlements, with villages, towers, small castles and large fortified villages that can be related to important changes in their environments.

06 PERSIA AND ITS NEIGHBOURS: SASANIAN FRONTIERS IN LOCAL AND IMPERIAL PERSPECTIVES

Author: Hopper, Kristen - Durham University
Co-Author: Lawrence, Dan - Durham University (Presenting author)
Keywords: Frontiers, Sasanian, settlement
Presentation Preference: Oral

The ERC funded Persia and its Neighbours Project has been investigating the landscapes of the northern and western frontiers of the Sasanian Empire (AD 224 – 651) through field survey, satellite remote sensing and excavations. Through this research it has become apparent that the Sasanian Empire invested heavily in security and production on many of its frontiers; however, these frontier landscapes were also clearly adapted to the local environments in which they existed and reflect diverse cultural, social and economic histories. This paper will compare and contrast frontier landscapes in Northeast Iran, the South Caucasus (Georgia, Azerbaijan), and Syria, and consider the relationship between natural and cultural frontiers in long-term perspective, as well as highlight the relationship between the development of these frontiers and pre-existing settlement patterns, the role of mobility in local subsistence strategies, and the types of political entities they bordered. Furthermore, we will briefly discuss how imperial strategies and settlement patterns in these zones compare to those in several 'core regions' of the empire.

359 BEYOND THE (ONE) ROOF

Theme: 6. Interpreting the archaeological record
Author: Romankiewicz, Tanja (United Kingdom) - University of Edinburgh
Co-Author(s): McCullagh, Roderick (United Kingdom) - Independent ScholarPostma, Daniël (Netherlands) - Independent ScholarWinger, Katja (Germany) - Freie Universität Berlin
Keywords: dwelling practices, settlement mobility, seasonality
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Following on from sessions in Glasgow (2015) and Vilnius (2016), when we discussed the archaeology of roofed domestic spaces and the social practices that occurred there, we now want to take the conversation beyond the eaves of the individual house.

We believe that most traditional societies, especially those dwelling in strongly seasonal environments, shift their more light-demanding, more ventilation and space-requiring, foul-smelling or hazardous activities from under the roof whenever they can. If correct, we have to be interested in looking at the archaeological evidence beyond the roof for important aspects of dwelling practices in order to understand past lives more holistically.

Such an approach also needs to move away from considering single dwellings for single households. One house stance often contains several superimposed buildings, roof after roof built, taken down, collapsed or decayed. To gain a more integrated picture we need to approach the changing, shifting and closing of these complex dwelling purposes as well.

In this year's session we propose to investigate the archaeological evidence for changes in the built environment, from inside to outside, from day to night, from summer to winter, from generation to generation, from space to place – and this across all periods and places, from the Palaeolithic to the early modern.

01 LIVING AND WORKING WITHIN OR OUTSIDE A DARK IRON AGE HOUSE. REFLECTIONS MADE FROM THE WELL PRESERVED DANISH LONGHOUSES.

Author: Ph.D Haue, Niels - Historical Museum of Northern Jutland (Presenting author)
Keywords: Settlement, Households, Iron-Age
Presentation Preference: Oral

The study of the well preserved Iron Age longhouses has a long history in Northern Jutland. In the 1920's, Gudmund Hatt excavated a number of burned houses which contributed greatly to our understanding of the interior and the architecture of the longhouses. Well preserved doors, fireplaces and even parts of the walls have been excavated, together with large quantities of clay vessels and wooden boxes, marking the storage areas and "kitchen" areas within the house. But so far, barely any traces of activities outside the Longhouses have been documented or integrated into the interpretation of households. So where is the outdoor activity area for the individual household? And where is the equivalent common area for village activities? Where did they slaughter their livestock, prepare animal hides, dry their fish and undertake any other dreadfully smelly processes? And would these processes leave any archaeological evidence? Another question is whether activities demanding light (eg. weaving) could be carried out within the longhouse. The longhouses in Early Iron Age Denmark are usually interpreted as dwellings for a single household. The longhouses are often clustered together in regulated hamlets or villages, leaving a limited "private" area outside each longhouse. But evidence of any outside working areas are still lacking. Considering the smoke and lack of light within the houses, many activities were probably carried out outside the houses.
So were the longhouses merely intended for shelter and storage, rather than being the heart and hearth of the household and their activities?

02 YOU ARE WHERE YOU EAT: WORLDVIEW AND THE PUBLIC/PRIVATE PREPARATION AND CONSUMPTION OF FOOD

Author: Dr Morrison, Wendy - University of Oxford (Presenting author)
Keywords: public/private, domestic, food-preparation,
Presentation Preference: Oral

Based upon the study of rural domestic assemblages from the Late Iron Age and Early Roman period of southern Britain, this chapter explores the connection between the use of space for food preparation, consumption, and disposal and the worldview of the individuals involved. Innovations in the later Iron Age, influenced by increased exposure to continental foodstuffs, containers, and preparation techniques were widely accepted in some homes and largely rejected in others. This must be more nuanced than a simple economic explanation of who could afford to buy new things. Equally, there must be a more complex narrative than the simple assimilation/resistance model – rejection does not always mean resistance. Using Douglas' matrix of cultural possibilities, we can begin to relate domestic assemblages and domestic organisation of space to the individuals who surrounded themselves with them and make some suggestions about what drove their consumer choices. Can we tease out an understanding of how past peoples saw and related to the world around them from the archaeological remains of domestic cooking and eating spaces?

03 DYNAMIC PREHISTORIC ARCHITECTURES BEYOND THE ONE ROOF

Author: Dr Romankiewicz, Tanja - University of Edinburgh (Presenting author)
Keywords: Prehistory, households, landscape
Presentation Preference: Oral

This paper will investigate the architectural manifestations created by different households to "house" their social, cultural and economic practices. A comparative approach beyond the focus of the "four walls" will discuss similarities and differences across different regions in rural contexts of later prehistory. Starting from the rich Scottish evidence the paper will explore case studies from northern and central Europe for recurring themes regarding the dynamics in building and rebuilding and the use of materials in different landscape contexts.

The analysis attempts a holistic approach that is not focused on architectural products within a set landscape, but aims to address how building practises were integrated into different landscape textures and resources, and how built structures affected the landscape they were built in. Taking a theoretical, interdisciplinary approach, the paper

combines archaeological analysis with architectural design theory to propose a picture that is much more complicated than often anticipated. It presents a dynamic interplay between the different factors that influence rural settlement.

This paper builds on the experiences from the previous EAA sessions under related topics, and the theoretical perspectives presented here are intended to set the scene and raise discussion points that hope to stimulate this session's debate.

04 THE MEDIEVAL INDUSTRIAL-RESIDENTIAL COMPLEX IN NORTH PRIOB'E

Author: Mrs. Chikunova, Irina - Institute of the problems of Northern development, SB RAS (Presenting author)
Keywords: Seasonality, household
Presentation Preference: Poster

In 2013-2015 the settlement Ust-Vasyegan 1 was studied. It is located on the banks of the Ob river, 9 km SW from Salekhard. In the excavations we had a unique material that complements the block of information about ancient history and the processes of development of territories in the Northern Ob ' region in the various eras.
The residential complex of three rooms were excavated on the fortified settlement. The largest room was used for household work, cleaning fish and cooking. The average (second) room intended for sleep and rest. In the third room were engaged in metal processing. We can talk about the existence of industrial and residential complex in the studied part of the settlement, belonging to one family – one household. The close location to each other, the single earthen fence, and fragments of some of the vessels are in all three rooms also show this. The thrown items suggests that the residents of the settlement lived there permanently, all year round. The settlers were engaged in fishing, hunting and gathering depending on the time of year. The city was located in the favorable place to control of the river ways, to engage in trade.
Radiocarbonic analysis determined the existence of the settlement during the XI-XII centuries. The ceramic complex of the city of Ust -Vasyugan 1 has special characteristics, but combines many features of Southern and Western medieval cultural formations.

05 "JUNTOS PERO NO REVUELTOS": DEVELOPMENTAL CYCLE OF HOUSEHOLDS IN A COMPACT LAYOUT LATE PREHISPANIC SETTLEMENT IN NASCA, PERU (1470-1532 AD)

Author: Siveroni, Viviana - Institute of Archaeology, University College London (Presenting author)
Keywords: domestic architecture Nasca
Presentation Preference: Oral

The mapping of individual household residences in the architecture of archaeological sites has hardly been an easy task. Delineating residences is most often carried out with some degree of confidence by archaeologists when spatial segregation of buildings allows for an intuitively direct definition of groupings. Things get more complicated, however, in compact layout settlements —where there is no space between buildings. In the latter, attention to micro-stratigraphy, and wall abutment and bonding patterns, as well as feature distribution in the architectural space, is essential to carry out the task.
My research in the Nasca area proposed to investigate the nature of social groupings living in residential conglomerates or compounds typical of highly agglutinated Late Prehispanic Period Nasca settlements (1470-1532 AD), South Coast of Peru. Residential compounds are essentially groups of small conjoint structures between rectangular open spaces, typical of compact large habitation sites (ca. 20 ha) of this period. Other researchers have proposed, based on surface remains, these compounds are the residence of multi-family households. Based on my excavations of Compound C03 (ca. 20 conjoint structures and a patio) in Huayuri, I suggest these compounds are the result of organic growth. Based on micro-stratigraphy, and patterns of wall bonding and abutment, distribution of plastered floors, storage and cooking areas (used as indicators of different dimensions of households), I suggest these compounds are the residences of various individual small but closely related households. Hearth variability vis-à-vis Weismantel's (1989) ethnographic work is used to evaluate the idea of the developmental cycle as an underlying factor to the architectural configuration we see in the archaeological record.

360 ARCHAEOLOGICAL EVIDENCE FOR ADVERTISING, PROMOTIONS AND "MARKETING" IN ANTIQUITY.

Theme: 6. Interpreting the archaeological record
Author: Miączewska, Anna Beata (Poland) - Uniwersytet Marii Curie-Skłodowskiej
Co-Author(s): Angius, Andrea (Italy) - Università Roma TreBedin, Edoardo (Italy) - Independent researcher
Keywords: advertising, promotions, local markets, trading
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The purpose of this session is to provide a wide spectrum of opinions exploring i.e. ancient methods for disseminating knowledge about specific events and places and/or communicating the superiority of one product over another. Due to the fact that advertising is considered as purely modern concept (associated these days with mass media and fast exchange of information), it is the aim of this session to challenge this incorrect view and answer questions on: 1) how advertising was developing in the remote past; 2) who was primarily involved in the process of advertising and promotions; 3) how and why advertising and promoting were substantial elements of every local trading systems; 4) whether it is possible to consider that the practises which are nowadays defined as marketing were also successfully functioning in antiquity.
We invite to our session specialists in archaeology and history whose field experience, case studies and scholarly examinations brought to light material and artefacts which could be recognised as expressions of the abovementioned processes. It is our intention not to limit the session to specific geographical region or narrow time-frames (speakers working on projects other than antiquity are very welcome to apply), but to allow professionals in the areas of i.e. iconography, epigraphy, ceramics, trade, economy, etc. to present various perspectives on advertising, its operating, functions and practicality in the remote past.

01 THE WINE "ADVERTISING" IN THE ROMAN WORLD: BETWEEN COMMERCE, STATUS AND PLEASURE.

Author: Prof./Dr. Cavicchioli, Marina - Federal University of Bahia (Presenting author)
Keywords: wine, pleasure, adverting
Presentation Preference: Oral

The wine was a very important merchandise in the roman world. Produced in many distinct parts of the Empire, and consumed, in different ways, in all the roman world, its commerce was huge and complex. From the basic dietary drink gave to slaves to the very expensive specials "crus", writing sources talked about different wines, and different social meanings for then, what can be attested in archaeological evidences too. Nevertheless, several studies focused on the wine economy, production and trade, but nome on the wine advertising. We intend, in this paper, to examine labels, wall paintings, coins, and other material sources that represent wine and its association with luxury and pleasure, thinking if they can be considered one kind of advertising.

02 ANNOUNCEMENTS OF GLADIATORIAL GAMES IN POMPEII: PROMOTING AND ADVERTISING THE SPACTACULA

Author: Mgr Miaczewska, Anna - Uniwersytet Marii Curie-Skłodowskiej (Presenting author)
Keywords: munera, edicta, Pompeii
Presentation Preference: Oral

The numerous 'annunci' studied in details by P. Sabbatini-Tumolesi explained the phenomenon of informing the inhabitants of Pompeii and other Campanian towns about the upcoming venationes and munera. Her careful analysis of the edicta provided linguistic, prosopographical and chronological contexts for the spectacula announcements which were placed on the walls of Pompeii in the 1st century AD. Apart from a very generic statement on their role as advertising elements, no in-depth examination into the nature of ancient promoting of gladiatorial games was attempted.

The aim of this paper is, therefore, to provide the definition of advertising processes which in ancient Pompeii functioned against the backdrop of highly developed organisational skills of the editores, well-trained gladiators, ambitious lanistae and predominantly curious audience. On the most basic level, ancient advertising will be perceived as referring to the same fundamentals which also nowadays designate the mechanisms of communicating information in order to convince the recipient to act in a particular way. By using ancient evidence (yet, inevitably, modern terminology to describe their context) this paper will explain the methods of building up ancient marketing practises for the purpose of encouraging spectators to view the games at the arena and increasing the popularity of the local amphitheatric entertainments. It will also seek to answer questions on the scope and necessity of advertising the gladiatorial games – thus challenging the commonly accepted notion that spectacula was so remarkably popular it did not require any forms of further publicising. The paper will additionally look into other, less obvious, forms of intentional propagating of the upcoming gladiatorial combats – i.e. libella, cena, pompa, etc.

03 AUGUSTAN AND FASCIST PROPAGANDA: CAN WE COMPARE THE TWO "REVOLUTIONS"?

Author: Mr De Vecchi, Lorenzo - University of Trieste (Presenting author)
Keywords: Augustus, Fascism, Propaganda
Presentation Preference: Oral

Starting from Ronald Syme's classic work, the radical transformation of the Roman State during the Augustan Age has often been interpreted through the perspective of some typically modern concepts - advertising, propaganda, marketing - also comparing it explicitly to modern totalitarisms.
Despite being less vigorous today, this interpretive custom is still deep-rooted. Therefore, the questions is whether the parallelism between ancient and modern revolutions has any scientific basis. Can the Italian fascist revolution be compared with Octavian's revolution, "the first march on Rome" described by Luciano Canfora following Syme's approach? If this is the case, how can this be affirmed in terms of "marketing" and "propaganda" without surrendering to anachronism or superficiality?
The paper will attempt to answer these questions by focusing on the meanings and the use of terms such as restoration and revolution during ancient and modern times.

361 CULTURE, NATURE AND THE DIVINE: MAINTAINING THE SACRAL ACROSS THE LONG DURÉE

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Beusing, Ruth (Germany) - Römisch-Germanische Kommission des Deutschen Archäologischen Instituts
Co-Author(s): Newman, Conor (Ireland) - National University of Ireland GalwaySchot, Roseanne (Ireland) - Discovery Programme IrelandBergh, Stefan (Ireland) - National University of Ireland GalwayRassmann, Knut (Germany) - Römisch-Germanische Kommission des Deutschen Archäologischen Instituts
Keywords: sacred sites, multi-periodicity, multi-disciplinarity, performance
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Sacred complexes comprise some of the most iconic and challenging phenomena in the European archaeological record. Longevity of use, multi-periodicity, succession and appropriation raise intriguing questions that test both diachronicities and traditional disciplinary boundaries. Leading studies of sacred complexes across Europe routinely draw on archaeological, anthropological, historical, ethnographical, linguistic and sociological approaches to generate more complete 'pictures' of such places.

Papers in this session will both reflect and problematize diachronic and multi-disciplinary approaches by interrogating themes of location and siting, monument morphology, multi-periodicity, longevity, paraphernalia and symbolism. This session will focus in particular on themes of procession, disclosure, ceremony and choreography at sacred complexes, analysing the interplay of three-dimensional space (architecture and topography) and the longue durée, nature, ritual, movement and performance in the creation of the hierophanic.

01 NATURE, CULTURE AND CHAOS, AND THE INSTITUTION OF SACRAL KINGSHIP

Author: Mr Newman, conor - National University of Ireland Galway (Presenting author)
Keywords: hierogamy cosmograph royal
Presentation Preference: Oral

Hierogamy and cosmography lie at the heart of the institution of kingship and speak to the centrality of the challenge of the nature-culture nexus. This paper will consider how these phenomena manifest in the archaeological record and are amplified and revealed through myth and toponymy.

02 " WHITISH STONES" – INCOMPREHENSIBLE SACRED ELEMENTS?

Author: Mrs Pantmann, Pernille - Museum of Northern Zealand (Presenting author)
Keywords: Sacred whitish stones
Presentation Preference: Oral

Throughout the Scandinavian iron age and Viking period (500 BC – 1060 AD), whitish stones seem to have been sacred elements in both wetlands, on settlements as well as in graves. Though they seem to bear no witness of human handling, their archaeological context suggests otherwise. In the contexts of settlements and graves, they are difficult to separate from stones in general, however in peat, stones only occur when placed by humans. The whitish stones seem to interact with other objects in sacred contexts. Sometimes they are scattered around, mixed with other sacred elements, in other cases the stones seem to be concentrated in piles.Through this long timespan, the sacred actions changed and perhaps the idea of the whitish stones changed accordingly, but they were still part of some sacred actions.
Whitish stones are difficult to handle from an archaeological point of view, since they bear no clear indications of being handled by humans. This means, that the context is vital for understanding the stones. Without clear knowledge of the context, the stones are just objects of nature. The whitish stones are nonetheless significant parts of the great variety of sacred actions from this long duration of time. Though the meaning of the whitish stones perhaps is unclear to us today, the idea of using stones to mark or celebrate something, nonetheless is a well-known phenomenon from historic periods and in different cultures.
Perhaps the geographical spread and the duration of sacred use will expand, when whitish stones are acknowledged as being worth documenting and incorporated in the interpretations of an archaeological site. Given that stones played a significant part of scared actions in earlier periods throughout Europe, this might not be unrealistic. Therefore, the sacred use of whitish stones is perhaps not as incomprehensible as it might seem.

03 CONTINUITY ACROSS TIME: BRINGING THE PAST AND ENSURING THE FUTURE

Author: Dr. Higginbottom, Gail - Australian National University (Presenting author)
Co-Author: Professor Clay, Roger - University of Adelaide
Keywords: Continuity, cosmology, megaliths
Presentation Preference: Oral

Rather than looking at one place across time, this paper identifies how nature, culture and the divine were consistently constructed across long durée creating 100s of connected structures across the landscape in Scotland. Using multi-disciplinary approaches from the hard and social sciences linked to location and siting (landscapes), monument morphology, and considerations of the dead, this paper will demonstrate that there is a direct connection between the monuments built in the late Neolithic down to the end of the Bronze Age. Through innovative statistics and software we show specifically that visible astronomical-landscape variables found at Bronze Age sites on the inner isles and mainland of western Scotland were actually first established nearly two millennia earlier, with the erection of two of the earliest "great circles" in Britain: Callanish on the Isle of Lewis and Stenness on the Isle of Orkney. It is seen that whilst different standing-stone monuments were created over time with a mixture of landscapes, we nevertheless see that highly relevant aspects remained unchanged through these years; namely notions of procession, disclosure, ceremony and choreography in the creation of the hierophanic as partially demonstrated at EAA previously. This suggests that there is some continuity of this cosmological system through time, despite the various radical material and social changes that occurred from the late Neolithic to the Late Bronze Age. It is suggested that the notion of the circularity of time and place was possibly responsible for such long-lasting traditions.

04 THE ALIGNMENTS OF CARNAC (BRITTANY, FRANCE) AS SACRED SPACE FROM THE NEOLITHIC TILL TODAY

Author: Dr. Perschke, Reena - Museum Lichtenberg (Berlin) (Presenting author)
Keywords: Sacred alignments megalith
Presentation Preference: Oral

The Neolithic menhir alignments and some megalithic dolmens in the surroundings of Carnac stand since their erection highly visible in the landscape of this scarcely wooded coastal region. Therefore, each immigrating culture was challenged to form an opinion about these massive standing stones and their meaning. Furthermore, most generations of the respective local inhabitants were changing the sites by reerecting fallen stones, using the menhirs as freely available building material, moving menhirs, destroying stones, or adding new stones – a process that has not been delayed till today despite the heritage protection laws of France.
In a first reutilisation step, some megalithic structures were used for burials from Bell Beaker Culture, Bronze Age and Early Iron Age. Later, the Gallo-Romans respected the stone rows of Carnac by reerecting some fallen menhirs. Unaware of the customs of the former Celtic inhabitants, they interpreted the dolmens as recent chthontic places of worship and rededicated them into rural fana by introducing structures made of tegulae and small columns as well as depositing divine figurines, libation vessels, precious objects, and in one case even a votive altar with inscription. In a third step and with the beginning of written records, early medieval Council reports damn the continued veneration of stone monuments.
Until today, the stone alignments and dolmens are considered as sacred complexes, even in the current French guide of the Centre des Monuments Nationaux intitulated "Les Alignements de Carnac – Temples Néolithiques". Neo-druids perform their annual rituals at the megalithic sites of Carnac and reclaim pagan ancestors' rights, ignoring that neither the Iron Age Celts nor the immigrating Early Middle Age Bretons left signs of worship at the megaliths. Due to their monumentality, inexplicability and significant visibility, the standing stones sacralize the landscape in many ways even in our enlighted era today.

05 INTERPRETING CHANGE AND CONSISTENCY IN LANDSCAPES OF RELIGIOUS SYMBOLS

Author: Dr. Beusing, Ruth - Romano-Germanic Commission (German Archaeological Institute) (Presenting author)
Co-Author: Dr. Rassmann, Knut - Romano-Germanic Commission (German Archaeological Institute)
Keywords: sacred, landscapes, contextualization
Presentation Preference: Oral

Religious beliefs have long been described as the engine of social integration and cohesion. Their representations can be manifold and aren't restricted to demonstrative places of ritual, but can also be implemented in mundane practices as well as in places, that do not necessarily show their designation readily. Nevertheless, sacred monuments often seem to be most readily identified and are subject to many archaeological studies. The study of religious monuments within prehistoric landscapes facilitates their contextualisation. It helps us to better understand the religious communities, practising within them. Sometimes it is possible to trace and explain their continuous use over long time spans. Additionally, assessment with an interdisciplinary set of tools enhances the information about these landscapes.
Nevertheless, different factors might influence the interpretation of continuous use or reuse of these sites and landscapes, e.g. the movement of people, contacts with new forms of religious beliefs and lifeways. In the archaeological evidence we only deal with results of such modifications to the sites. Here landscape analyses can help to better understand processes and changes to the archaeological monuments. Moreover, the tendency of archaeologists to study sites in time slices, being focused on certain archaeological periods may also bias the understanding of these places and landscapes in chronological depth.
The paper presents a comparative study of sacred sites in different showcase landscapes in Europe, demonstrating limits, constraints and interpretative potential.

06 MIND THE GAP: TRANSCENDING BOUNDARIES AND NEGOTIATING POWER AT THE HILL OF TARA, EASTERN IRELAND

Author: Dr Schot, Roseanne - The Discovery Programme (Presenting author)
Keywords: Boundaries, transformation, kingship
Presentation Preference: Oral

The construction and use of monuments is a primary means by which we understand processes of place-making and sacralisation. Archaeological survey and excavation at the cultic 'royal' centre of Tara have shown that time and again over its more than 4,000-year history as a sanctuary, the sacrality of the hill was conferred through (re)creative acts, from the building of burial mounds and large, open-air temples to the performance of sacred rites and ceremonies. This paper focuses on developments at Tara during the Iron Age (c.600BC–AD400) and draws on archaeology, early Irish sources, anthropology and ethnography to explore the interplay between outward manifestations of power and the kingly ideal, in which legitimate authority has its source in the otherworld. As 'cultural originators', ancestors and deities loom large in the ideology of early Irish kingship and are referenced in myriad ways in the archaeological record, and more widely in myth and place-names. Special attention is given here to the convergence at Tara of transformative activities such as funerary ritual and metalworking, whose success relied on a symbolic crossing of boundaries. These activities occurred in tandem with a growing emphasis on the physical demarcation of boundaries, seen in the elaboration of enclosure boundaries and the placement of special deposits in ditches and other liminal locations. Together these phenomena encapsulate the principles of separation and renewal that lie at the root of sacral kingship, and may be understood as a means of negotiating or controlling 'outside' forces, be they natural or divine.

07 SURVEY AND EXCAVATION AT THE HILL OF WARD, CO, MEATH, IRELAND: CONTINUITY AND METAMORPHOSIS OVER THE LONGUE DURÉE

Author: Dr Davis, Stephen - University College Dublin (Presenting author)
Keywords: Bronze Age, Medieval
Presentation Preference: Oral

This paper presents the results of remote sensing survey and excavation at the large multi-period hilltop enclosure of Tlachtga, Hill of Ward, Co. Meath Ireland. The site as it is currently constituted comprises a quadrivallate enclosure focused upon a 40m diameter central mound. Geomagnetic survey has revealed the presence of two earlier enclosures partially overbuilt by the present site, with a northeast-southwest axis of embellishment. Excavation over three seasons has demonstrated that the earliest of these was constructed in the Bronze Age (c. 1200 cal BC) with earlier activity on the site indicated by both Neolithic and early Bronze Age material culture. The Bronze Age enclosure was levelled in the early Iron Age (c. 400 cal BC), with renewed enclosure of the hilltop, perhaps referencing the earlier trivallate form, begun in the late Iron Age (c. 400 AD). A fundamental shift in site morphology took place in the C10th with the construction of a single phase central mound, on site precious metal-working and a shift in industrial activity away from the main area of enclosure. Successive phases of construction both reference and re-work earlier phases of monumentality, perhaps at a landscape scale. Significant quantities of animal bone at the site suggest a focus on ritual activity in both the Bronze Age and late Iron Age phases, with significant change in the latest phase, where the central mound is entirely sterile with the exception of a Neolithic axe and an early Bronze Age projectile point. This paper aims to present a biography of Tlachtga and its landscape over five millennia of change and persistence.

08 SACRALISATION OF TRAPS - THE COMPLEX CREATION OF "SÁMI CIRCULAR OFFERING SITES"

Author: Dr. Spangen, Marte - Independent researcher (Presenting author)
Keywords: Sacralisation, Sámi, traps
Presentation Preference: Oral

For more than 150 years the prevailing interpretation of a certain kind of stone wall enclosures in northern Norway has been that they are Sámi offering sites. Studies of the research history suggest that this has been based on a scholarly hypothesis rather than on archaeological, historical or ethnographic evidence. Contrary to this, a re-evaluation of such sources, including studies of morphology, finds, various sample analyses, topography, landscape, distribution and place names, indicate that these large stone structures were initially built and used as wolf traps in the Middle Ages. However, some of these have evidently been reconceptualised locally as ritual sites, whether this happened sooner or later after the constructions went out of use as traps. This reinterpretation has subsequently become more widespread and reinforced in both academia and the Sámi and non-Sámi public through the professional authorisation of the idea by ethnographers, archaeologists and museum workers in the 19th and 20th century. Among other things, this has led to local use of some structures as ritual sites from the 1970s onwards. Over the last few decades an increasing amount of more or less similar structures have been recorded as the same phenomenon. This appears to be partly due to the convenient and, in Sámi contexts, unusually lasting physical expression of assumed rituals and sacred space, partly to stereotypical ideas about traditional Sámi culture and landscape use, and partly because of the limitations that new digital recording methods and standards put on the interpretations made in the field. This paper explores how materiality, landscape affordance, and archaeological methods, practices and theoretical approaches, combined with

persistent stereotypes about the Sámi, as well as the socio-political contexts of the research and interpretations, have created highly complex interrelated local and professional sacralisations of the so-called "Sámi circular offering sites".

362 PRESENTING ARCHAEOLOGY - THE GOOD, THE BAD AND THE UGLY

Theme: 2. The Valletta Convention: the next 25 years
Author:
Co-Author(s): Wait, Gerry (United Kingdom) - Nexus HeritageVan den Dries, Monique (Netherlands) - Leiden University
Keywords: presentation, public archaeology, collaboration, policy
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The presentation of archaeological remains and sites is of fundamental importance in society's understanding of and attitude towards archaeology. Instruments such as Article 9 of the Valetta Convention as well as the ICOMOS Ename Charter provide valuable guidelines for the presentation process within its social, political and educational context, not only in research archaeology but also in CRM contexts. The way in which these guidelines and policy intentions relate to actual practice, however, is less clear. Conceptual, financial, political, tourism and design related decisions are often made outside the direct scope of archaeologists, which means that the presentation of archaeology is not always in the hands of our profession - with both good and bad practices as a direct result. In this session, we invite international practitioners active in the field of archaeology, museum design and heritage presentation to reflect not only on what went well, but also on what went wrong. By learning from the mistakes we made and the lessons we learned, this session aims to reflect upon the ways in which we, as archaeological professionals, might influence the presentation process more effectively.

01 EXPERIENCE THE PREHISTORY OF THE VELUWE: HOW TO INSPIRE THE LIVING WITH THE DEAD.

Author: Doctorandus (Drs.) Vossen, Nathalie - PRO-Erfgoed; Municipality Epe
Co-Author: Doctorandus (Drs.) Parlevliet, Masja - Municipality Apeldoorn (Presenting author)
Keywords: Burial-mounds, landscape, museum
Presentation Preference: Oral

Almost 4000 burial mounds are known in the Netherlands, of which the largest concentration is situated on the Veluwe (approximately 700). The Veluwe is the second largest nature-area in the Netherlands, with woods, heaths, sandplains, estates and spectacular views. Here lies the oldest mound of the Netherlands (municipality of Apeldoorn) and the tumulus-line at Vaassen (municipality of Epe) with 50 burial mounds on a six-kilometre long line.

Because of research we know more and more about the burial mounds, so we can tell stories about the special and unique burial mounds to a wide audience. Because there is still no place in the Netherlands where the stories and the history of the burial mounds come together, we think that it is time for a tumulus-center. It is very powerful to the public as stories about the burial mounds and prehistory come together in one place in a landscape that fits. Because without story, the burial mounds are only bumps of sand where people were buried.

What does it take to realize a tumulus-center? Who takes the initiative for the realization? Which audience can the centre draw? Is there really a need for such a centre?
Just a few questions that we, the archaeologists of the municipalities of Apeldoorn and Epe, are investigating. Therefore, we would sincerely like to exchange views with colleagues from other countries.

02 PRESENTING 'INVISIBLE' SITES IN SITU WITH THE SOIL SLIDER.

Author: Van Gils, Marijn - Flemish Heritage Agency (Presenting author)
Co-Author: Bastiaens, Jan - Flemish Heritage Agency; Steenhoudt, Joris - Appeltien Engineering; Huyghe, Natalie - Flemish Heritage Agency; Van der Veken, Bas - Regionaal Landschap Kleine en Grote Nete; Natuurpunt; Vancampenhout, Karen - KU Leuven – Technology Campus Geel
Keywords: in situ presentation
Presentation Preference: Oral

The majority of archaeological sites shows no visible remains at the present surface. For certain periods and/or regions, even the entire archaeology is completely subterraneous. The 'invisible' sites constitute an important part of our archaeological heritage. Presenting them in situ to the general public remains a continuous challenge. The local landscape and soil are often the only on-site features which can be linked to the archaeology for telling the story of this type of site. While the landscape is readily visible at the surface, soil profiles pose a series of challenges. If soil profiles are exposed in their natural position, how can their preservation be ensured? How can they be protected against the impact of the elements, flora, fauna and visitors? And if they are not exposed, how can soil profiles be visualized to the general public above the surface without losing their contextual meaning? The Soil Slider is a new presentation device for soil profiles and archaeology. It was conceived to meet not only these challenges, but also specific requirements for the nature reserve environment for which its prototype was designed. This case illustrates how creative and new solutions can be found through intense cooperation between archaeologists and presentation specialists, between heritage management and nature management, and between public and private sector.

03 COMBINING AWARENESS AND PUBLIC SUPPORT FOR ARCHAEOLOGY WITH IN SITU PRESERVATION OF AN ARCHAEOLOGICAL MONUMENT: REVISITED AFTER 4 YEARS

Author: Dr Van Os, Bertil - Rijksdienst voor het cultureel erfgoed (Presenting author)
Co-Author: Drs Schreurs, José - Rijksdienst voor het Cultureel Erfgoed; Drs De Groot, Tessa - Rijksdienst voor het Cultureel Erfgoed; Mr Van Wijk, Theo - Stichting Domplein; Drs Wynia, Herre - Utrecht Archeology; Drs Hoegen, Robert - ex situ archeology
Keywords: "in-situ-preservation", "Urban-archaeology", "awareness"
Presentation Preference: Oral

Preserving archaeological remains in situ is one of the main objectives of the Valletta Treaty, which was signed by the Dutch government in 1992. Subsequently, preservation in situ has become one of the pillars of archaeological heritage management in the Netherlands. Another objective of the Treaty is the promotion of heritage education and

raising of public awareness for the protection and investigation of archaeological heritage. This goal has received far less attention until recently. The design and building of an underground visitor centre, DOMunder, raised an important question: How can we transform an archaeological monument into an asset for the community and at the same time ensure long lasting preservation?
This paper reports on the transformation of an archaeological monument in Utrecht, the fourth city of the Netherlands, into an experience for the public, DOMunder. This project was initiated and directed by a foundation, whose goal it is to let the public discover the local history. Not many parallels exist, as most archaeological sites in urban environments are seen as a burden for development. Sites are generally either excavated or left in situ; in both cases the archaeology remains invisible and inaccessible to the public. In the case of DOMunder, the location in a wet sedimentary environment provided even more challenges.
The center is now open for four years. How did the monument fare during this period?

04 ARCHAEOLOGICAL REMAINS IN ANTWERP, TO SEE OR NOT TO SEE...STILL THE QUESTION.

Author: Mrs Schryvers, Anne - City of Antwerp, Department of Archaeology (Presenting author)
Keywords: remains, presenting, Antwerp
Presentation Preference: Oral

As an archaeologist, it is an honour to work for a city like Antwerp, a city with a rich past and a beating historical heart. At the same time, it's a challenge, since Antwerp is a dynamic city, constantly in development, measuring itself in the spirit of the times. Therefore, lots of possibilities are created to execute archaeological research in the city, and that's great. But then what? Sometimes these remains are beautifully preserved or impressive to see, but conservation in situ is not possible. Or not possible anymore...we still cope with the problem that archaeology is often incorporated in the planning process at a (too?) late stage. A number of times decisions have been made and there's no way back. The possibilities which are left are either presenting the remains elsewhere or a visualisation above ground. Sometimes that pays off, sometimes it's a real let-down.

But of course, the city of Antwerp has also learned from the past and we can be proud of some projects in which the archaeological remains play an important role. Through some of these preservations, the inhabitants and visitors can enjoy the historical greatness of the city. And these projects can be an example for future developers.
As an example: in the summer of 2017, a large-scale infrastructural project starts in the centre of Antwerp in which both the archaeological excavations and remains shall be integrated in the public space.

It's fascinating to combine the past of a city with its present: fascinating and challenging because a city needs to move forward but not at all costs. Local heritage management should aim to meet both, past and present.

05 CONSIDERING DEPICTION PRACTICES

Author: Dr van den Dries, Monique - Faculty of Archaeology, Leiden University (Presenting author)
Keywords: Depictions, representation, stereotypes
Presentation Preference: Oral

Quantitative analyses of how the past and archaeological professionals are being depicted in for instance exhibitions, journals end books, offers valuable – and sometime confronting - insights in how presentation practices seem to remain stuck in stereotypes. It turns out that very often archaeology and the archaeological past is almost exclusively associated with males and masculine activities. This of course bends the truth of what actually happened in past societies; could it perhaps also explain why public participation in archaeology is more widespread among males than females, as survey results repeatedly have shown?

06 ARCHAEOLOGICAL RECONSTRUCTIONS AS TOURIST ATTRACTIONS. THE ARCHAEOLOGICAL HERITAGE - AN OBJECT OF PLEASURE OR A BASE OF IDENTITY.

Author: Mrs Byszewska, Agata - Narodowy Instytut Dziedzictwa / National Heritage Board Of Poland (Presenting author)
Keywords: presentation, management, recontruction
Presentation Preference: Oral

The European Convention for the Protection of the Archaeological Heritage of La Valetta, 1992. (1996.), The European Landscape Convention of 2000. Documents like Venice Charter of 1964, the International Charter for the Protection and Management of Archaeological Heritage adopted by ICOMOS in 1990, the Burra Charter of 1999 and the Charter of Krakow in 2000 set the direction of the heritage preservation and management. These documents define how to protect the archaeological heritage, emphasize the specifics and the "delicacy" of the nonrenewable archaeological heritage and indicate the need for its protection. The question of the presentation of the archaeological heritage and making it available to the public is very important issue. One of the ways of popularization of the archaeological heritage are reconstructions. In Poland, since several years, an increasing number of such facilities has been built. Mostly it`s the initiative of local governments and museums in order to increase the attractiveness of the region and revive tourism. This way of visualizing the past is very suggestive. However, several factors contributed to the fact that these objects have an destructive impact on archaeological heritage and the educational and popularizing values are minimal. Analysis of investments related to the reconstruction of archaeological objects allowed to determine the main reasons for this state of affairs: excessive haste in implementation of the projects, the lack of reliable studies, the lack of cooperation between researchers, museum specialists, educators, not using methods of experimental archeology. These are just a few reasons. At the same time the positive examples allow to conclude the proper directions and standards of management of the cultural landscape and making it more accessible and understandable to the public.

07 IT'S HARD TO KEEP YOUR ANCESTORS ALIVE THE IMPACT OF AN EXCAVATION TO THE IDENTITY OF A COMMUNITY.

Author: Dr. Van der Velde, Henk - ADC ArcheoProjecten (Presenting author)
Keywords: identity, communal involvement
Presentation Preference: Oral

In 2015 near Dalfsen (prov of Overijssel, Netherlands) the remains of a huge burial ground dating from the Funnel beaker period (3200-2700 BC) were found. It was not only the biggest burial ground known from this period in northwestern Europe, it created a lot of attention from the residents of Dalfsen. Just after the national press left the village, the city council (which was prior to this excavation very critical towards archaeology) decided that this remarkable find not only has to be integrated into the design of the new residential

area but also a program had to be created to integrate it in the communal remembrance of the village. In this contribution (anno 2017) the first results of this project (the treasure of Dalfsen) will be reviewed. Did the village succeed and if so, what projects were the most successful? After two years are the ancestors of Dalfsen still alive?

08 LOOKING FOR THE COMMUNITY: LIMITS AND CHALLENGES OF COMMUNITY INVOLVEMENT IN ARCHEOLOGICAL SITES MANAGEMENT

Author: Nevado, Aníbal - Universitat Autonoma de Barcelona (Presenting author)
Co-Author: Gonzalez-Marcen, Paloma - Universitat Autònoma de Barcelona
Keywords: sites, accessibility, community
Presentation Preference: Oral

From the perspective of archaeological research, the implementation of projects for public access to archeological sites arises as a response to different kind of challenges whose balanced articulation is often difficult to accomplish. First, the ethical and requirement of accessibility and public enjoyment of heritage can be considered as the starting point for these interventions. However, in parallel, it is intended that these accessible archaeological sites become also economic and cultural dynamizers of the area where they are located. A third element, associated with the first, but not directly, is that these sites and the scientific work carried out in them are known, valued and vindicated by local communities and generate processes of synergy between them and archaeologists .
Despite the financial and technical constraints, it can be considered that for the first of these objectives the results that are intended to obtain can be foreseen quite adequately. For the second of them, the establishment of agreements and strategies of collaboration with local stakeholders allow to generate also tangible outcomes. However, the active participation and appreciation of local communities implies the handling of more complex variables and methods that often escape the capabilities and planning possibilities of archaeological teams.
To illustrate these points, we will present the case of two Paleolithic sites in Catalonia (Roca dels Bous and Cova Gran de Santa Linya), located in a rural area near the Pyrenees, where in the last ten years an ambitious outreach program has been carried out. Although in general terms the program can be described as successful, actions aimed at strengthening relations with local communities have not proved positive. For this reason, a new plan has been designed, specifically designed to address this third pending aspect of the program for the dissemination and socialization of archaeological heritage.

09 "THOSE ARE NOT THE DRUIDS YOU'RE LOOKING FOR..." ARCHAEOLOGY MEETS THE PUBLIC – EXPECTATIONS RELOADED

Author: Schwenzer, Gerit - University of Vienna (Presenting author)
Keywords: cultural mediation, presentation
Presentation Preference: Oral

Whenever archaeology is brought to the public – in museums, at excavations, in the media – there is always a struggle in how to transmit science and related issues to a very diverse audience. There are different focuses in different institutions, the public ranges from school child to pensioner, which implies that a variety of expectations must be met. These might have been nourished by the media or by clichés that are stuck in people's minds and are therefore hard to modify. Many misunderstandings are the result of fantastic mixtures – due to a variety of reasons – of epochs and cultures, which mean no harm in any way but have the effect of developing an old-fashioned or even wrong picture of our past. As far as archaeology itself is concerned, it is often regarded in a very dreary light, while in fact it offers such a variety of different working fields and so many possibilities in interdisciplinary research.
Since people have such expectations and clichés in mind, it is hard to keep a balance when faced with these expectations in order to explain or clarify circumstances without breaking or disturbing the interest by maybe disappointing the anticipation. But, on the other hand, what do we expect from ourselves when working with the public? Can we achieve to serve the needs on either side to the satisfaction of both of them?

The paper discusses a few examples of the difficulties we probably all share when communicating with the public. It is supposed to prompt a discussion where everybody is invited to contribute to ideas and possible ways of building a bridge to the public more effectively in the future.

10 A RENEGADE PRESENTATION

Author: Lindskog, Daniel - DLD - Daniel Lindskog Design (Presenting author)
Keywords: Interpretation, Presentation, Understanding
Presentation Preference: Oral

Who controls the past?
This suggestion might surprise you. A revolution of communication is upon us and if we don't adapt we'll miss out.
By sharing insights to a secret guerilla coup unfolding in the southern part of Sweden where a renegade presentation is taking the existing signs and putting a layer of interpretation upon it, I aim to highlight an alternative presentation where consideration has been given the way information becomes knowledge and how the communication of this knowledge can be optimized for understanding.
The world has turned and we can no longer adopt old methods when communicating new knowledge. The expert no longer works for, or with us, and we need to reconsider our way of presenting the past, otherwise the future might be lost forever.
Coming from a decade spent in the design industry I recently got a degree in archaeology in order to be a part of the presentation of our cultural heritage. I will share what I've learned so far, but you probably won't like it.

11 WESTGATE OXFORD POP UP MUSEUM: TAKING ARCHAEOLOGY OUT INTO THE CITY

Author: Miss Peacock, Rebecca - Oxford Archaeology (Presenting author)
Keywords: museum, outreach, collaboration
Presentation Preference: Oral

Westgate Oxford is a commercial redevelopment of a large shopping complex in the centre of Oxford, with clients Westgate Oxford Alliance and Principal Contractors Laing O'Rourke. The excavations, carried out by Oxford Archaeology, between 2014 and 2016, were required as part of UK Planning Guidelines and were the largest ever undertaken in the City and principally focused on a large medieval suburban friary. The project won Best Archaeological Project 2016 at the prestigious national British Archaeological Awards and

the outreach programme, which included an evolving Pop Up Museum (4 different locations), and a series of site open days that, together, attracted over 11,500 public visits, plus a schools engagement programme, and a lecture series along with other community collaborations, was a significant contributing factor in gaining this accolade.

This paper will present how the Pop Up Museum was conceived and evolved over a 12 month period. It will show that through collaboration with local groups it exceeded the requirements for outreach contained within the Local Authorities project brief. The paper will demonstrate that a temporary exhibition can address the changing story from an archaeological site in 'real-time' and present artefacts to the public that are unlikely to be on show in a conventional museum display case. The Pop Up Museum became a focal point for further events such as 'Reminiscences sessions' for the old, and school visits for the young, and became the principal method for dissemination away from the Health and Safety constraints of a large modern construction site. The paper will discuss how the Pop Up Museum encouraged and fostered relationships between commercial archaeology, museums and community groups in a university city.

12 THE MANY ROADS OF PUBLIC OUTREACH: PODCASTING AS ONE ROAD TO CONNECT WITH THE PUBLIC ABOUT ARCHAEOLOGY.

Author: Ms Belmonte, Cristina - IPAT Cultural Services (Servico cultural); Cooking with Archaeologists
Co-Author: Dr Amundsen, Colin - Archaeological Museum of Stavanger; Cooking with Archaeologists (Presenting author)
Keywords: podcasting, public outreach
Presentation Preference: Oral

As archaeologists, we take for granted that most of the public have the same level of passion and interest in the past as we do, but unfortunately, this is not the case. The problem for archaeologists could be we really do not know who our "customers" are. Marketing to just the public at large is an extremely broad approach filled with the pitfall of not engaging enough of the public so it might be important first to define who within the general public would have the most interest in your new discovery and then tailor your presentation to that audience. At the podcast "Cooking with Archaeologists" we are using digital media, social media marketing, and our experience from the business world to do just that. This has been a trial-and-error project filled with uncertainty and doubt until we accurately discovered who was actually listening. In this presentation, we will reveal what we have learned from this exciting and somewhat demanding venture, and how podcasting can bring the public new knowledge and a behind-the-scenes peek at the life of an archaeologist.

13 GENERATING UNIVERSAL HUMAN VALUES AT UNESCO WORLD HERITAGE SITES

Author: Dr Perry, Sara - University of York (Presenting author)
Keywords: UNESCO, interpretation, emotion
Presentation Preference: Oral

UNESCO World Heritage Sites (WHS) are premised upon so-called 'universal' value—a concept which presumes some form of connection between all human beings across time and space. In other words, we are collectively meant to recognise these sites as part of 'our' world, and as important to the whole of humanity. Whether or not one agrees with such an essentialising approach, I would argue that critiques against it have eclipsed efforts to empirically probe its validity. Here I discuss collaborative endeavours at a series of WHS's across Europe, Turkey and Egypt to explore the nature of these universals via innovation in emotionally-resonant heritage interpretation. My teams and I are driven by the question of whether such sites might genuinely be turned into places where the world comes to meet, know and understand one another through evocative forms of presentation. Whilst reviewing the many difficulties we have confronted in responding to the subject, this talk aims to hint at the promise of emotions-driven interpretation at heritage sites for bettering and fostering lasting, positive relationships in the present between people -- friends and strangers, locals and foreigners, in-person and online visitors -- around the globe.

14 EMOTION DESIGN AS A METHODOLOGICAL APPROACH TOWARDS ARCHAEOLOGICAL PRESENTATION

Author: Dr. van der Linde, Sjoerd - Studio Louter (Presenting author)
Keywords: emotion, presentation, public
Presentation Preference: Oral

Whilst archaeologists are increasingly involved in the presentation of archaeological findings during the research process, they are not always involved in the actual design process of the resulting archaeological sites and findings where decisions are mostly made between commissioning party and spatial/museum designers. This situation can lead to diminished visitor experiences, as there often exists a gap between archaeologists with a tendency to focus on scientific accuracy, and designers and commissioners who focus on the effective production of media.
In this paper, I will argue for Emotion Design as a bridging methodological approach to presenting archaeology. This methodology makes a clear distinction between the objective story (the facts) and the subjective story (the morals, the story behind the story) as to come to a clear concept in the form of an engaging narrative supported by all stakeholders that has the power to move and engage visitors.
By drawing upon several case studies, I will argue how a meaningful connection to the past can only be achieved by evoking the emotions of the visitor, especially if these are in constant relation to a clearly developed core interpretive message.

363 FUNERARY ARCHAEOLOGY: NEW DEVELOPMENTS IN BURIAL TAPHONOMY AND ARCHAEOTHANATOLOGY

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Schotsmans, Eline (France) - University of Bordeaux
Co-Author(s): Mickleburgh, Hayley (Netherlands) - Leiden UniversityGerdau-Radonic, Karina (United Kingdom) - Bournemouth University
Keywords: Taphonomy, Archaeothanatology, Funerary practices, Experiments
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Over the last 35 years, taphonomy has gained increased importance in several different disciplines. As a result of this focus on taphonomy, the depositional environment has

become more important for the contextual information that it can provide. This is an asset in the study of funerary practices.
Without studying the depositional environment, the study of funerary practices is almost impossible. Similarly, archaeothanatological studies stress the importance of studying skeletal remains in their depositional context.
Despite the increasing importance of burial taphonomy and archaeothanatology there are a few issues related with this 'young' discipline. First, taphonomic interpretations are not based on fixed methods. A variety of methods, techniques and theoretical approaches are incorporated from several disciplines. The absence of consistency in the use of the methods makes it difficult to compare results. The second main problem is that there is a lack of comparative case studies and experimental research. Finally, there is a lack of standard nomenclature. Not all researchers agree about the meaning of terminology in funerary archaeology.
This session aims to gather researchers in the field of funerary archaeology, burial taphonomy and archaeothanatology to discuss (1) New developments in the field of burial taphonomy (2) the issues in the discipline, (3) directions for standardisation of nomenclature and methods and (4) the future of this discipline.
While the session format will consist of 15min papers, the organisers aim to give enough time for discussion.

01 THE TAPHONOMY OF THE UNBURIED DEAD: DECOMPOSITION IN VOIDS AS A RESULT OF THE MIGRATION PERIOD MASSACRE AT SANDBY BORG

Author: Alfsdotter, Clara - Linnaeus University; Bohusläns Museum (Presenting author)
Keywords: Taphonomy archaeothanatology void
Presentation Preference: Oral

The ringfort Sandby borg is located by the seaside on the Swedish island Öland. It was in use during the Migration period (AD 400 - 550). During recent excavations, the remains of at least 26 unburied humans have been found inside houses and out on the streets. Several skeletons display peri mortem trauma. The elemental and trauma characteristics imply interpersonal violence but resemble that of a mass execution rather than a battle field and the archaeological remains are understood as a massacre.

Sandby borg was seemingly deserted after the assault, leaving no one to care for the dead or their belongings. The zooarchaeological record implies that animals were abandoned to starve. Food was still lying by the hearth and luxury items were left exposed. This "frozen moment" archaeology not only creates possibilities to study the brutal attack, but also unique insights into the everyday life of the Migration period.

The context of the Sandby borg skeletons demands extensive taphonomic documentation and analysis. Not only do the skeletal record answer questions on how the individuals were killed and their bodies handled, but they also provide insights into the spatial context in which they were left to decompose. The bioarchaeological remains are analyzed through archaeothanatological methods. To gain deeper knowledge regarding the biological and taphonomic aspects of decomposition in voids, forensic settings are studied as a first attempt to better understand the course of decomposition, articulation and disarticulation.

The Sandby borg case study calls to attention the need to gain deeper knowledge about the taphonomy of unburied bodies and void decomposition within archaeology. The exploration of "deviant" treatment of the dead is a central theme in the ongoing bioarchaeological research.

02 LATER ANGLO-SAXON WOODEN COFFINS – CAN ARCHAEOTHANATOLOGY HELP TO FIND THEM

Author: Mrs Green, Emma - University of Sheffield (Presenting author)
Co-Author: Dr Craig-Atkins, Elizabeth - University of Sheffield
Keywords: Archaeothanatology, coffins, taphonomy
Presentation Preference: Oral

Recent funerary studies of the later Anglo-Saxon period (c. A. D.650-1100) have established that a variety of different containers for the body were widely used, but have concluded so-called 'plain earth graves' were the norm. However, many containers will have been constructed entirely from wood, decomposing completely, rendering them archaeologically invisible and confounding attempts to explore their prevalence or provision. Various sources of evidence are employed inconsistently and there is no standardized methodology in place to ascertain whether a grave might have originally held a wooden container.
Archaeothanatology, a holistic approach conceived in France, utilizes all available evidence, both archaeological and osteological, from the grave in order to reconstruct the original burial tableau. This includes detailed observations of the spatial positioning of skeletal elements to characterize taphonomy and reveal funerary practices that would otherwise be archaeologically invisible. However, archaeothanatology suffers from a lack of comparative case studies for exploring the effects of different burial environments upon the decomposition and disarticulation of a human corpse within the grave.
In order to try and resolve the problems with identification of later Anglo-Saxon wooden coffins this paper will present the archaeothanatological analysis of skeletons from graves where the burial environment is known. In these burials preserved wood and metalwork have provided conclusive evidence for coffins. This information, as well as adding to our overall knowledge about decomposition within a wooden container, has been used to develop a tailored method to assist in the identification of coffins from this period. In the future this methodology will be applied to burials without surviving evidence for coffins with the aim of differentiating coffined burials from plain earth graves more reliably, and thus revealing the true extent of coffin use during the later Anglo-Saxon period.

03 THE TAPHONOMY OF FUNERARY WOODEN TRUNKS AND CHESTS: A VIEW FROM ITALY

Author: Full-time Researcher Vanzetti, Alessandro - University of Rome \ (Presenting author)
Co-Author: BA Solaini, Prisca - University of Rome "La Sapienza"
Keywords: Trunk-burials, taphonomy, protohistory
Presentation Preference: Oral

Inhumation burials in the Italian Bronze and Iron Ages are generally found without a clearly encasing wooden structure. This is certainly mainly due to formation processes of the record, given the general climate and burial situations, avoiding hyper-arid or waterlogged situations. This fact has brought to a diffuse attitude toward burials, as being intepreted mainly as earthen, possibly shrouded burials, with a scarce attention to detailed taphonomic processes, setting aside clear "in vacuo" depositions.
On the contrary, the existence of some waterlogged burials, or of other depositional special situations, underlines the relative frequency of trunk burials in the Italian Bronze and Iron Age. It is useful to develop a taphonomic approach to the published burial contexts, in order to decode traces that can reveal the existence of a former burial inserted in a -later decayed- wooden structure. This evidence can be usefully compared with wider, and parallelepipedal chest/casket structures.
The analysis is relevant also for burials in other temperate climate depositional environments, as a starting point for a wider theory of displacements in "in vacuo" but constricted wooden environments.

04 DUST 'N' BONES – COMBINING ANTHROPOLOGY AND GEOARCHAEOLOGY AS A PROMISING TOOL FOR BONE TAPHONOMY

Author: Brönnimann, David - Integrative Prehistory and Archaeological Science, University of Basel, Switzerland (Presenting author)
Co-Author: Portmann, Cordula - Integrative Prehistory and Archaeological Science, University of Basel, Switzerland; Department of Biomedical Engineering, University of Basel, Switzerland; Dr Pichler, Sandra - Integrative Prehistory and Archaeological Science, University of Basel, Switzerland
Keywords: Histology, Geoarchaeology, Taphonomy
Presentation Preference: Oral

Histological methods play an increasing role in funerary archaeology. Histotaphonomy analyses bioerosive processes due to fungi or bacteria as well as further taphonomic signatures like bone collagen content in human and faunal skeletal remains from archaeological contexts. Micromorphological investigations provide data on the composition, genesis and formation of sediments. Bone reacts sensitively to changes in sedimentary environments, so even small splinters routinely encountered in micromorphological thin sections represent useful proxies for the reconstruction of sedimentary processes. Integrating data on bone microstructure and processes of physiological degradation as well as on sediment composition and genesis, histotaphonomy thus provides information on specific sedimentary environments as well as on the taphonomic biographies of bones.
At the late La Tène site of Basel-Gasfabrik (Switzerland), human skeletal remains were analysed using a combination of histological, geoarchaeological and micromorphological procedures. Synthesizing the results with findings from the archaeological and osteological investigation enabled us to trace multistage burial processes for specific bone individuals.
The combination of anthropological and geoarchaeological approaches proved highly productive. Firstly, it permitted a detailed assessment of complex processes in the handling of the dead in the late Iron Age. Furthermore, our results demonstrate that the approaches are complementary in their techniques and topics so that this interdisciplinary collaboration also generates additional methodological benefits.

05 TREATMENTS OF THE DEAD IN FUNERARY CONTEXT: RITUAL DISARTICULATION IN PREHISTORY OF ARCHIPELAGO

Author: Dr. Ishikawa, Takeshi - Kyushu University (Presenting author)
Keywords: dis-articulation, funerary, deviant
Presentation Preference: Oral

Dis-articulation is a type of deviant treatments of the dead. Among multifaceted unusual managements of the corpse, dis-articulating body parts in funerary context had an intense visual and emotional effect on the living. In this sense, this kind of deviant practice might effectively materialize the dead body as social resource.
This study reconstructs mortuary practices associating with the dis-articulation of body part by integrating human bone position at sites and artificial modifications left on them such as cut marks. Dis-articulation of the dead was previously studied by focusing on the anatomically unusual position of skeletal remains in prehistoric Japan. However, cut marks left by those practices were not found in most cases.
By detailed observations skeletal remains belonging the prehistoric periods of the Jomon and the Yayoi in the archipelago, small and slight cut marks were found from skeletal remains, which were found in deviant manner from anatomical bone positions. In addition to the finding, there were also cut marks which seemed to have indirect or no association with the dis-articulations of specific body parts.
I will argue the possibility of more comprehensive approach to reconstruct the deviant mortuary practices using dead body with including cut marks other than directly associating with the dis-articulation of particular body parts. This kind of cut marks can contribute to the reconstruction of mortuary practices which were unknown from only interrelations of bone positions. These practices might include attempted dis-articulation and also include only cuttings of the body as a ritual performance to avoid the re-birth of the dead and its spirits. Focusing upon these modifications, it will be possible to understand purpose and intention of past people to attempt deviant mortuary treatments of the dead in more accurate way.

06 ANTHROPIC TRANSFORMATION OF CADAVERS AT TEOUMA (VANUATU)

Author: Dr valentin, frederique - CNRS (Presenting author)
Co-Author: Dr Allièse, Florence - MNHN; Dr Bedford, Stuart - ANU; Prof. Spriggs, Matthew - ANU
Keywords: Lapita, Vanuatu, funerary
Presentation Preference: Oral

Funerary treatments affect the course of body decomposition. We will use here the descriptive tool of "funerary chaine opératoire" to approach the purposeful transformation of the deceased buried at the Lapita cemetery of Teouma (Vanuatu). We will highlight body transformations at different time of the funerary sequence though several different kinds of treatments, performed by several different operators.

07 RECONSTRUCTING THE MORTUARY CHAÎNE OPÉRATOIRE IN THE NEOLITHIC NEAR EAST: CONDUCTING ACTUALISTIC EXPERIMENTS FOR A BETTER UNDERSTANDING OF BURIAL PRACTICES.

Author: Dr M.J. Schotsmans, Eline - University of Bordeaux (Presenting author)
Co-Author: Dr Ueland, Maiken - University of Technology Sydney, Australia; Dr Luong, Susan - University of Wollongong, Australia; Dr C. Prinsloo, Linda - University of Wollongong, Australia; Dr Nizio, Katie - University of Technology Sydney, Australia; Prof. F. Wallman, James - University of Wollongong, Australia; Prof. L. Forbes, Shari - University of Technology Sydney, Australia; Prof. J. Knüsel, Christopher - University of Bordeaux
Keywords: Neolithic, experiments, desiccation
Presentation Preference: Oral

Near Eastern Neolithic funerary practices encompass a range of practices, including intramural primary and secondary burials, as well as the retention, curation and re-deposition of skeletal elements, especially of crania and mandibles. Based on current observations at several Near Eastern Pre-Pottery Neolithic B sites, it is hypothesised that more complex, multi-stage mortuary practices were employed, including natural desiccation, defleshing and dismemberment of corpses. This study investigates pre-burial treatment and the mortuary chaîne opératoire in the Neolithic Near East by integrating principles from forensic science and taphonomy in archaeo-anthropological investigations. Actualistic experiments were carried out at the Australian Facility for Taphonomic Experimental Research (AFTER) to better understand Neolithic multi-stage funerary and mortuary practices and their link to social organisation and ideology.

08 AN EXPERIMENTAL APPROACH TO THE INTERPRETATION OF PREHISTORIC CREMATIONS

Author: Curator, ph.d. Henriksen, Mogens Bo - Odense Bys Museer (Presenting author)
Keywords: cremation, experiment, typology
Presentation Preference: Oral

Most studies of prehistoric cremation graves have focused on the typology of the grave goods or the osteological material. So far, there has been less focus on the processes that shaped the structures and objects, which are uncovered in archaeological excavations. To be able to answer questions about technical aspects of the cremation process and to investigate what was left after the cremation (traces in the ground, parts of the cremated carcass, charcoal and pyre goods etc.) four cremation experiments including pig carcasses were carried out in 1989-92. Three of the experimental pyres were excavated – two of them more than 20 years after the experiments. When comparing the leftovers from the experiments with the material from prehistoric pyre sites and cremation graves it is possible to distinguish between the products of pyrotechnical, cultural and post depositional (natural) processes. These observations are essential for the understanding of the rituals connected to the prehistoric cremation practice. Furthermore, the experimental results are useful to prepare a more precise typology of prehistoric cremation graves.

09 EXPERIMENTAL FUNERARY TAPHONOMY: DOCUMENTING JOINT DISARTICULATION AND BONE DISPLACEMENT IN ACTUALISTIC EXPERIMENTS TO IMPROVE ANALYSIS AND INTERPRETATION OF HUMAN BURIALS

Author: Dr. Mickleburgh, Hayley - Leiden University (Presenting author)
Keywords: experimental taphonomy, disarticulation
Presentation Preference: Oral

This paper discusses the preliminary findings of actualistic experiments in human decomposition and skeletal disarticulation, undertaken at the human decomposition facility of the Forensic Anthropology Center at Texas State University (FACTS). This research allows examination of specific taphonomic processes that form archaeological (and forensic) human burial features, and represents the first controlled experimental observation of the effects of different variables on the final position of the skeletal remains. For the purposes of this project, the influence of body position, decomposition in primary open and closed spaces, and burial in desiccated (mummified) condition on final bone position was investigated.
Soft tissue decomposition and bone disarticulation were observed in five willed donated human bodies. Displacement of the body (parts) and bones over time was captured and movements quantified using 3D photogrammetry. The results of this study support earlier suggestions that (subtle) variations in body position can greatly affect patterns of disarticulation and bone displacement. The process of skeletal disarticulation observed in this study was complex, and involved multiple instances of displacement of bones out of anatomical position prior to loss of all the connective tissues, as well as continued articulation after all connective tissues were lost. Some cases of disarticulation followed by 're-articulation' were observed. These observations cast doubt upon disarticulation sequences derived from archaeological burials, as these processes could not (currently) be inferred from archaeological data. This research indicates that actualistic studies are crucial to understand the effects of different variables on final bone position.

10 3D LASER SCANNER AND VIRTUAL MODEL: TWO USEFUL TOOLS FOR BURIAL TAPHONOMY

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Keywords: Burial taphonomy
Presentation Preference: Oral

The Neolithic burial of Avignon-La Balance-Ilot P (Southern France) was partially excavated, removed as a whole and surrounded by a wooden cast by J. Courtin in 1974. Stored at the Calvet Museum during 35 years, this burial was subjected to laboratory excavation and multidisciplinary research.

The body was lying on his left side and was remarkably associated with 158 Columbella rustica shells and 16 red deer canines. Three subsequent operations of excavation and 3D recording have been carried out.

As a result, the use of 3D Laser Scanner for a burial survey provides a double benefit. First, thanks to the microtopography of the archaeological finds, the accuracy and reliability of the data recording increase. Second, the millimetric resolution and the virtual model provide a major support for the taphonomic analysis of the skeletal elements and the relationships between the body and the beads.

11 RESCUE ARCHAEOLOGY IS THE FUTURE? ON AN INTEGRATED 3D AND TAPHONOMY APPROACH TO DOCUMENTATION IN ST OLOF CEMETERY, LUND, SWEDEN

Author: PhD Wilhelmson, Helene - Sydsvensk arkeologi AB (Presenting author)
Keywords: rescue excavation, 3D
Presentation Preference: Oral

The potential of taphonomical analysis of human remains in situ has been advocated fiercely internationally in bioarchaeology the past ten years (fx Knudson & Stojanowski 2008; Knüsel 2010; Knüsel & Robb 2016; Rakita, 2014). In particular the examples of the Archaeothanatology approach have clearly demonstrated results of interest, and of relevance, to archaeology at large. However, the practical use of an Archaeothanatology or similar approach are, despite the awareness of the potentiall, currently modest, especially in rescue excavations. The time aspect of the documentation is a major problem.
With todays employment of digital technology in excavation, as well as postprocessing, in archaeology, we have the possibility to change not only how to document but also analyse any burial context. The comparably low cost of the Image based modeling (IBM) providing 3D models with high detail can be integrated with GIS and form a basis for a detailed taphonomical discussion. We can save time and money by adopting this as our documentation. Moreover, it is also decidedly superior in quality to more traditional drawing and ortophotos, as well as in a medium approachable also to non-experts (Wilhelmson & Dell'Unto 2015).
Here I will present how we have worked with IBM integrated in 3DGIS in a rescue archaeology situation. The examples from St Olofs cemetery in Lund, a medieval city burial ground intensely used for 300-400 years at least illustrate how this approach works when implemented on a small (single burial) and larger scale (entire cemetery). We used 3D not only to document but also as a tool to analyse and use taphonomy to address archaeological research questions on stratigraphy and feature formation through time. The aim is to demonstrate how a new standard for documentation can be a way forward for taphonomy, today and for the future as well.

12 EXAMPLES OF BRONZE AGE "DEVIANT BURIALS": INSIGHTS FROM OSTEOARCHAEOLOGY, BURIAL TAPHONOMY, PALAEOPATHOLOGY AND BIOMOLECULAR ANALYSES

Author: Meyer, Christian - OsteoARC (Presenting author)
Co-Author: Knipper, Corina - Curt-Engelhorn-Zentrum Archäometrie gGmbH; Warnberg, Ole - Universität Mainz; Schunke, Torsten - Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt; Alt, Kurt - Danube Private University
Keywords: Taphonomy, Palaeopathology, Osteology
Presentation Preference: Oral

"Burial" features, the final resting places of deceased individuals, contain a wealth of information central to various disciplines within the ever widening field of archaeology. Some of this information is stored in the arrangement of the bodies, in grave goods, grave placement and grave architecture, some is stored in the biological profile of the individuals themselves. It is well known that combining archaeological and biological evidence will result in a more holistic understanding of the burial feature itself. But burials are not static features, they are subject to many taphonomic processes that may alter their appearance, content, preservation and therefore also the interpretation arrived at by the archaeologist. Burials are dynamic environments and their analysis is incomplete if a dedicated appreciation of burial taphonomy is lacking. This is especially true for burials that are evidently outside the reconstructed "norm" for a given time and region.
By looking at two "deviant" and complex funerary depositions from the Bronze Age of Germany, which were block-lifted from the field, we would like to exemplify an integrative and detailed approach that consciously includes osteoarchaeology, palaeopathology, biomolecular analyses and, above all, burial taphonomy to understand these features as best as possible and to enable sound interpretations. Burials have to be understood as dynamic parts of the natural landscape into which they have been embedded and many "natural" processes may mimic human intervention. "Reading" these taphonomic signs in the right way, especially in tandem with pathological lesions in human skeletal remains, will further our understanding of the diversity of funerary practices and how their final appearance may have been changed over time. The chosen examples will feature healed and unhealed traumatic injuries, lesions of infectious disease, developmental anomalies, traces of animal activity, burning, decapitation and other lesions that are all part of the overall funerary context.

13 A CASE STUDY OF A SECONDARY BURIAL FROM CORDED WARE CULTURE IN ESTONIA - PROBLEMS AND RESULTS

Author: Ms Varul, Liivi - Tallinn University (Presenting author)
Co-Author: Tõrv, Mari - ; Kriiska, Aivar - ; Saag, Lehti - ; Metspalu, Mait - ; Lõugas, Lembi -
Keywords: secondary burial, reinterpretation
Presentation Preference: Oral

A burial from the Corded Ware Culture was unearthed in North-Eastern Estonia in 1926. Initially it was suggested that the individual was in a strongly crouched position, possibly bound together. About 90 years later, the case has been revisited and a closer look at the documentation reveals that the original interpretation was incorrect. In fact, the human remains in the deposit were completely disarticulated. Additionally, some arguments can be presented to suggest that the remains in the secondary burial were arranged in a way to imitate a primary burial.
This presentation focuses on the difficulties of interpreting a disarticulated secondary burial which was excavated nearly a century ago. Although one case-study will be presented, the problems are surely familiar to anyone who has worked with archive material or with secondary deposits.

14 "DEVIANT" BURIAL IN MEDIEVAL AVARIAN NECROPOLIS OF PIONIRSKA ULICA (SERBIA)

Author: Professor Djuric, Marija - Laboratory for Anthropology, Faculty of Medicine, Belgrade (Serbia)
Co-Author: PhD Djukic, Ksenija - Laboratory for Anthropology, Faculty of Medicine, Belgrade (Serbia) (Presenting author); PhD student Pavlovic, Tamara - Laboratory for Anthropology, Faculty of Medicine, Belgrade (Serbia); PhD student Draskovic, Marko - Institute for Byzantine Studies, Serbian Academy of Sciences and Arts, Belgrade
Keywords: vampirism, taphonomy, Avars
Presentation Preference: Oral

Pionirska Ulica is an archaeological site located on the southern periphery of the city of Bečej, within the city zone (Northwest Serbia). Archaeological excavations were conducted on three occasions 1979, 1988 and 2003. The necropolis of Pionirska Ulica is dated between 6th and 8th century. The published archaeological reports indicate that this site represent Early Medieval Avarian necropolis of horse riders. Among 50 excavated graves, grave No 32 differs from others in unusual position of skeletal remains. The skeleton in situ was in extended supine position; however, skull in this grave was dislocated from anatomically correct position and found in the zone of the left forearm. However, the position of the mandible in the grave was as expected in the area of cervical vertebrae. Excavators also noticed presence of yellow soil in a circular pattern in the zone of skull and pelvic bones, indicating a new pit was dug into the grave after burial in the past. Archaeologist suggested that the position of the skull could be consequence of post-burial disturbance assumed execution or belief in vampirism as reasons. On the other hand, anatomically correct position of the mandible and anthropological analysis showing that there are no any marks of decapitation or trauma on the bones, suggest that execution likely should be excluded. Another assumption could be that grave disturbance in this case is related to some religious practice among Avars. The aim of this study is to reconstruct the possible circumstances for the unusual skull position as well as to consider alternative explanations for the grave disturbance such as grave-robbing or some taphonomical process.

15 BEYOND THE DATA. THE POTENTIAL FOR ARCHAEOTHANATOLOGY TO DRIVE THEORETICAL DEBATES IN MORTUARY ARCHAEOOGY.

Author: Dr. Nilsson Stutz, Liv - Emory University; Linneus University (Presenting author)
Keywords: archaeothanatology, ritual, practice
Presentation Preference: Oral

Since its conception, archaeothanatology has transformed the way in which we excavate and interpret the archaeological remains of mortuary practices. The data generated through this approach is more secure and more detailed, and we have reached a point where we are able to better reconstruct the chaîne opératoire of mortuary practices across a range of different deposits. These undeniable and tangible results, in combination with the analytical roots of the approach, have contributed to a perception that archaeothanatlogy is mainly an empirical affair. In this paper I will argue for the potential of archaeothanatology to build on this empirical foundation and contribute to a re-conceptualization of the archaeology of death. Through a series of case studies, this paper outlines how the methodological foundations can be firmly connected to interpretative archaeology grounded in ritual theory, practice theory, and body theory. Beyond simply adding theory, this paper positions the methodological approach as a foundation to rethink the archaeology of death.

366 EUROPEAN HUNTER-GATHERER WETLAND SITES: NEW DATA, MODELS AND PERSPECTIVES

Theme: 6. Interpreting the archaeological record
Author: Lübke, Harald (Germany) - Schleswig-Holstein State Museums Foundation Schloss Gottorf; Centre for Baltic and Scandinavian Archaeology (ZBSA)
Co-Author(s): Groß, Daniel (Germany) - Schleswig-Holstein State Museums Foundation Schloss Gottorf; Centre for Baltic and Scandinavian Archaeology (ZBSA)Koivisto, Satu (Finland) - National Board of Antiquities - Archaeological Field ServicesMilner, Nicky (United Kingdom) - University of York - Department of Archaeology
Keywords: Hunter-Gatherer, Wetlands, Mesolithic, Early Holocene
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The purpose of this session is to bring together specialists who work on wetland sites dating from the end of the last Ice Age to the introduction of farming. The excellent organic preservation of such sites provide a unique insight into past lives and have an enormous importance for the understanding of our past – especially for the temperate climatic zone north of the Alps. Interdisciplinary collaboration and cutting-edge scientific methods are enabling high-resolution palaeo-climatic and palaeo-environmental modelling to be used to discover how people reacted to and adapted to severe climate changes at the end of the Ice Age and in the early Holocene. Over the last five years, new research projects, especially in early Holocene Mesolithic wetland sites have been initiated throughout Europe
We would like to invite presentations about new results of archaeological investigation of Stone Age wetland sites from a wider perspective, which connect regional/local environmental databases to the archaeological record. Furthermore, we want to discuss the threat to such sites due to current climate change, modern farming practices and extraction of peat, resulting in rapid peat degradation and the destruction of this valuable archaeological heritage. We anticipate that through discussion of the various topics, the session will broaden our common knowledge of these archaeological resources, stimulate the growing interest of the scientific community in new areas of research on bog sites, and foster collaboration on an international level.

01 EUROPEAN HUNTER-GATHERER WETLAND SITES: NEW DATA, MODELS AND PERSPECTIVES. INTRODUCTION TALK

Author: Lübke, Harald - Centre for Baltic and Scandinavian Archaeology (ZBSA) (Presenting author)
Co-Author: Groß, Daniel - Centre for Baltic and Scandinavian Archaeology (ZBSA); Koivisto, Satu - National Board of Antiquities - Archaeological Field Services; Milner, Nicky - University of York - Department of Archaeology
Keywords: Hunter-Gatherer, StoneAge, Wetlands
Presentation Preference: Oral

The purpose of this session is to bring together specialists who work on wetland sites dating from the end of the last Ice Age to the introduction of farming. The excellent organic preservation of such sites provide a unique insight into past lives and have an enormous importance for the understanding of our past – especially for the temperate climatic zone north of the Alps. Interdisciplinary collaboration and cutting-edge scientific methods are enabling high-resolution palaeo-climatic and palaeo-environmental modelling to be used to discover how people reacted to and adapted to severe climate changes at the end of the Ice Age and in the early Holocene. Over the last five years, new research projects, especially in early Holocene Mesolithic bog sites have been initiated throughout Europe.
The session should inform about new results of archaeological investigation of Stone Age bog sites from a wider perspective, which connect regional/local environmental databases to the archaeological record. Furthermore, we want to discuss the threat to such sites due to current climate change, modern farming practices and extraction of peat, resulting in rapid peat degradation and the destruction of this valuable archaeological heritage. We anticipate that through discussion of the various topics, the session will broaden our common knowledge of these archaeological resources, stimulate the growing interest of the scientific community in new areas of research on bog sites, and foster collaboration on an international level.

02 PALEO AND HISTORICAL LANDSCAPE OF THE ZAMOSTJE 2 MICROREGION

Author: Dr. Lozovskaya, Olga - Institute for the History of Material Culture RAS; Sergiev Posad State History and Art Museum (Presenting author)
Keywords: Hunter-Gatherer, Wetlands, Paleolandscape
Presentation Preference: Oral

The microregion, in which the Zamostje 2 site is located, had been attractive for ancient hunter-fishermen-gatherers during several millennia: from mid-8th to late 4th mil. calBC. Though inhabitants' activities were largely influenced by climatic and environmental changes, they remained relatively stable throughout the existence of the settlement. Even later, in historical times, hunting and fishing were an underlying element of the local economic life as evidenced by written sources.

03 WETLANDS IN FINNISH STONE AGE RESEARCH – CURRENT STATE OF AFFAIRS

Author: Koivisto, Satu - National Board of Antiquities (Presenting author)
Keywords: wetlands, hunter-fisher-gatherers, Finland
Presentation Preference: Oral

Even though Finland is one of the mire-richest areas in Europe, wetland archaeological research has been quite scarce in our country. There have not been many attempts at generating an overall picture of Finnish wetland archaeological resources, or at developing methods for wetland archaeological site detection and heritage management strategies. The shore-bound settlement pattern of the Fennoscandian Mesolithic (ca. 9000–5100 cal BCE) and (Sub-)Neolithic (ca. 5100–2000 cal BCE) hunter-fisher-gatherer groups has resulted in the extensive use of coastal, riverine, and lacustrine landscapes. Human occupation was not restricted to the mineral soils, and the nearby waterways, waterfronts, and wetlands constituted an essential part of the living space that was used for an entire range of activities. Many of the occupation sites associated with a wetland setting have later been paludified, submerged, or inundated due to various natural processes, such as lake tilting, terrestrialization, and post-glacial isostatic rebound. This presentation sums up the current situation in integrating wetlands in Finnish Stone Age research and illustrates the most potential habitats where Mesolithic and (Sub-)Neolithic sites may be encountered.

04 WHY TO RE-EXCAVATE WETLAND SITES? TWO EXAMPLES FROM LITHUANIA

Author: Dr Piličiauskas, Gytis - Lithuanian Institute of History
Co-Author: Dr Piličiauskienė, Giedrė - Faculty of History, Vilnius University (Presenting author); Dr Kisielienė, Dalia - Laboratory of Quaternary Research, Nature Research Centre; PhD student Minkevičius, Karolis - Faculty of History, Vilnius University; Dr Gryguc, Gražyna - Laboratory of Quaternary Research, Nature Research Centre
Keywords: Sub-neolithic, wetlands, Lithuania
Presentation Preference: Oral

In Lithuania, a large number of Stone and Early Bronze Age sites, also including those in wetlands, have been extensively excavated during the period of Soviet occupation between 1940 and 1990. During these excavations, it was a norm for a 10-person expedition to excavate an area of up to 300 square meters per month, even while working at wetland sites with large quantities of wooden artefacts and structures. The outcome of these excavations is 10 monographs as well as tons of artefacts packed into the storage facilities of the Lithuanian National Museum. In regard to this accumulated material, some people, sometimes even archaeologists, raise the question of whether further excavations are necessary? This presentation aims to give an unambiguous answer to this question, supported by the most significant results of re-excavations at the key wetland sites in Lithuania - Šventoji 4 and Daktariškė 5.

05 ENIGMATIC T-SHAPED ANTLER AXES OF THE NORTH-EAST EUROPEAN FOREST ZONE

Author: Lübke, Harald - Centre for Baltic and Scandinavian Archaeology (ZBSA)
Co-Author: Vashanau, Aliaksandr - Institute of History NAS of Belarus (Presenting author); Berzins, Valdis - Institute of Latvian History, University of Latvia; Charniauski, Maxim - Institute of History NAS of Belarus; Meadows, John - Centre for Baltic and Scandinavian Archaeology (ZBSA); Leibniz Laboratory for Radiometric Dating and Stable Isotope Research, University of Kiel; Piezonka, Henny - Institute of Prehistory, University of Kiel
Keywords: Mesolithic Baltic Antlertools
Presentation Preference: 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 Ertebolle assemblages in Denmark and northern Germany, where they appear in the last centuries of the 5th millennium cal BC, but they have a much wider distribution to the southern east and west. 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 - currently the north-easternmost known examples - were dated by AMS in 2014, one giving the expected late 5th millennium date, but the other dating a thousand years earlier. In the absence of other directly dated examples from north-eastern Europe, it was suspected that the second artefact had been made using an already ancient antler. However, more than 20 T-shaped axes are now known from 2 regions of Belarus, marking the eastern edge of the known distribution of this artefact type. All of these finds are from alluvial deposits, although the concentrations of finds, and the identification of production waste in one region, provide the first indications of their archaeological context. We report the surprising results of a programme of direct AMS dating of these artefacts, and comment on their implications.

06 A MIDDLE MESOLITHIC BARK MAT IN SOUTH-WESTERN NORWAY?

Author: Ms Alræk Dugstad, Sigrid - University of Stavanger (Presenting author)
Co-Author: Dr. Eldegard Jensen, Christin - University of Stavanger
Keywords: Mesolithic, bark, Norway
Presentation Preference: Oral

A Middle Mesolithic site sealed beneath thick marine sediment on the small island of Kvitsøy, Norway, excavated in 2015, produced well-preserved bark in a distinct mat-like structure. This site contains sparse evidence of lithic artifacts, which makes human activity at the site difficult to recognize. The size and shape of the bark-dominated structure and the presence of burnt as well as unburnt bark, hazelnuts and hazelnut shells together with charcoal fragments may nevertheless indicate an anthropogenic origin. The bark deposit also contained some small artifacts of burnt flint. The site is however, severely disturbed by the later natural processes such as transgression of seawater, storm activity etc. Our working hypothesis is that this site may represent human activity e.g. comparable to the Northern German Duvensee finds of Mesolithic bark mats sealed under peat deposits. Unlike these sites there is a lack of distinct fireplaces, and the currently available 14C-dates from Kvitsøy cover a wider period than those from Duvensee. However, these dates remain within the Mesolithic period and the similarity of organic remains provides a basis for comparison between the sites. Preliminary results including palynological, archaeobotanical, geological and archaeological data will be presented and briefly discussed.

07 DATING THE LEGACY: MESOLITHIC BONE AND ANTLER TOOLS FROM NORTHERN GERMANY

Author: Dr. Groß, Daniel - Centre For Baltic And Scandinavian Archaeology (ZBSA) (Presenting author)
Co-Author: Dr. Lübke, Harald - Centre For Baltic And Scandinavian Archaeology (ZBSA); Dr. Meadows, John - Centre For Baltic And Scandinavian Archaeology (ZBSA); Christian-Albrechts-Universität zu Kiel, Leibniz-Labor für Altersbestimmung und Isotopenforschung; Dr. Schmölcke, Ulrich - Centre For Baltic And Scandinavian Archaeology (ZBSA)
Keywords: osseous tools, Mesolithic
Presentation Preference: Oral

Due to a very heterogeneous landscape the preservation of bone and antler tools in Northern Germany differs significantly. While marshes and peat bogs usually provide good conditions, outwash plains and drift sand areas show less favourable conditions. In this paper we want to present an overview of current studies on peat bog sites from Northern Germany with good organic preservation. Extensive radiocarbon dating programmes were carried out over the last years and extended the number of directly dated organic artefacts. Therefore, our current state-of-knowledge regarding osseous tool typo-chronology for the Mesolithic has been refined.
Against the background of site-related studies like in Friesack, Duvensee, or Hohen Viecheln, we will discuss the appearance of some tool types and prevailing forms during different timeslices. Since the aforementioned sites provide sound chronological models on a local scale, it is possible to integrate typologically distinct stray finds into an existing absolute chronological framework. Additional radiocarbon dates from underrepresented types on and areas are used to discuss the typo-chronological sequence during the Mesolithic in Northern Germany.
In this presentation we will concentrate on the south-eastern area of the state of Schleswig-Holstein where organic tools from the Mesolithic are found numerous. Thus most of the finds are not recovered during systematic excavations but were eroded from river banks or discovered during dredging out channels. Consequently, these artefacts usually

lack a solid context but nevertheless have to be understood as indicators for Mesolithic presence. Based on the current evidences and dating, new high-potential sites are identified for further studies. Addressing these, more results are expected to understand social transformations and cultural change during the Mesolithic in Northern Germany.

367 METHOD, THEORY AND INTERPRETATION: TOWARDS AN INTEGRATED FRAMEWORK FOR ARCHAEOLOGICAL GEOPHYSICS.

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: De Smedt, Philippe (Belgium) - Ghent University
Co-Author(s): Trinks, Immo (Austria) - Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology
Keywords: geophysical prospection, data interpretation, multidisciplinarity
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The application of geophysical prospection methods in archaeology has increased considerably over the past decade. A broad range of near-surface geophysical techniques has become a standard part of the archaeological toolbox. In landscape studies, particularly, these methods are surging, as novel approaches allow the non-invasive investigation of increasingly larger areas, at ever finer resolutions. Consequentially, geophysical prospection methods are leaving their mark on archaeological practice and theory, and are already affecting interpretive archaeological frameworks.In this session, we call to field archaeologists, geophysical prospectors, researchers and heritage professionals for contributions on current trends in archaeo-geophysical prospecting and their implementation into archaeological research frameworks. Specific focus will be on the analytical potential of geophysical datasets for scientific- as well as developer-led archaeology, and to which extent the (non-)application of geophysical techniques is warranted here. Debates on the interpretive advantages and limitations of these non-invasive approaches are welcomed, together with case studies that exemplify how geophysical methods can be used as an integral part of the archaeological work-flow. Presenters are encouraged to go beyond technological advancements, and critically assess the methodological and theoretical effects of archaeo-geophysics on current archaeology. In that context, this session aims to define the impact of geophysical prospection methods on shaping, preserving and disseminating archaeology for the years to come.

01 PART OF SOMETHING BIGGER. INTEGRATING GEOPHYSICS TO MULTIDISCIPLINARY PROJECTS IN OSTROWITE AND ROZPRZA (POLAND).

Author: Dr Sikora, Jerzy - Institute of Archaeology, University of Lodz (Presenting author)
Co-Author: Dr Kittel, Piotr - Department of Geomorphology and Palaeogeography, Faculty of Geographical Sciences, University of Lodz; Mr Wroniecki, p - Institute of Archaeology, University of Wrocław
Keywords: non-invasive, multidisciplinarity, GIS
Presentation Preference: Oral

Ostrowite is a large multi-period settlement complex in northern Poland (Pommerania) with an important medieval phase (11th – 13th century). It has been a subject of archaeological study since 2000, including a wide range of non-invasive archaeological prospection methods (2010-2017). They were supplemented by small scale excavations as part of a wider research project on the topic of medieval populations incorporating aDNA, stable isotopes and radiocarbon dating in order to better understand the past settlement processes during the period of christianisation of Pomerania.
The medieval ringfort and later motte timber castle site in Rozprza (central Poland) is dated from the 11th to 15th century. Its immediate surrounding and the stronghold itself were studied with the use of archaeological and geoarchaeological approaches, non-invasive methods, excavations, hand auger soundings and a number of specialised analyses in order to recognize the palaeoenvironmental evolution of the river valley in connection with changes of occupation and human impact on natural environment.
Both projects, although having different aims and objectives, had a common element: their mainstay were non-invasive prospection methods including: magnetic gradiometry, earth resistance, GPR, aerial photography, intensive field-walking, geochemical (phosphate) prospection, and analysis of Airborne Laser Scanning derivatives. All of them were integrated in GIS environment and had significant impact on the processes of reconstruction of medieval landscape and understanding the changes and development of settlement patterns. In both cases pitfalls were not avoided and difficulties were encountered in process of interpretation of non-invasive datasets. The key to success was constant cooperation (not only on the stage of acquisition and analysis of data, but also interpretation and synthesis) between specialists from different disciplines, especially archaeology, geophysics and geoarchaeology,.
The research projects have been financed by grants from The National Science Centre based on the decisions No. "DEC-2013/11/B/HS3/03785" and "UMO-2015/19/B/HS3/02124".

02 THE ROLE OF MAGNETOMETER SURVEY IN THE RESEARCH OF EARLY NEOLITHIC SETTLEMENT PATTERNS

Author: Mr Posselt, Martin - Posselt & Zickgraf Prospektionen GbR (Presenting author)
Keywords: Magnetometer-survey, Neolithic houses
Presentation Preference: Oral

In the early Neolithic period farmers brought a new concept of economics to central Europe and produced an enormous amount of traces underneath, which are preserved until today and can be detected by magnetometer survey (Linear Pottery Culture=LPC). One of the most speaking type of traces are the groundplans of early Neolithic houses. Although a lot of research is already done by large scale excavation the bandwidth of early Neolithic settlement patterns is not yet understood. The case studies of the Märzbachtal, Northrine-Westphalia, Germany on the one hand, where a settlement landscape consisted out of separate small settlements of up to 4 houses contrasts to the site of Eythra, Saxony, Germany, where one large settlement existed ranging in size for several km and embracing dozens of houses at the same time.
Within two case studies taken through in Idsteiner Senke and Mörlener Bucht, Hessen, Germany magnetometer survey was used to survey the sites of LPC landscapes at a micro region scale having started in 2001. By detecting, counting and evaluating especially the early Neolithic houses existing at the sites using almost completely nondestructive methods with magnetometer survey playing the major part the settlement system and its development in time and space could be reconstructed.
In March 2017 a research project was started researching the early neolithic settlement patterns in Targowisko, Lesser Poland Voivodeship, Poland. Along a ca. 3 km range along the course of the A4 motorway a dense set of several early Neolithic settlements (LPC) were excavated. With excavations being restricted to the narrow construction zone of the motorway it remained unclear to what pattern the early Neolithic settlements belong. Magnetometer survey was used to describe and evaluate the settlement system the earliest farmers at Targowisko used.

03 REASSESSING SURFACE ARTEFACT SCATTERS. THE INTEGRATION OF ARTEFACT-ACCURATE FIELDWALKING WITH GEOPHYSICAL AND HISTORICAL DATA AT MEDIEVAL HARBOUR SITES NEAR BRUGES.

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Keywords: Fieldwalking, EMI, proto-cadastral
Presentation Preference: Oral

Archaeological fieldwalking is particularly used to detect sites within a landscape, rather than to assess the internal structure of a site itself. Contributory to this trend is that surface artefact patterns collected by pedestrian field survey are rarely seen as valuable archaeological data for intra-site research. In recent decades, they have been overtaken by other non-invasive prospection methods, which seem to be more efficient and time-effective. This paper aims to reassess fieldwalking as a valuable intra-site prospection method and explores its added value when used in a multidisciplinary framework. Two late medieval deserted harbour sites and a complex of rural enclosures near Bruges served as test-cases for this research. All three sites were subjected to an intensive artefact-accurate fieldwalking survey in which every (featured) sherd was located separately, as well as an extensive geophysical survey. If available, these spatio-temporal archaeological data were confronted with contemporary proto-cadastral historical documents. The combination of both fieldwalking and geophysics showed both significant positive and negative relations between surface artefact scatters and subsurface anomalies, hence pointing to the complementary nature and added value of the methods being jointly applied. The results demonstrate that, although the sites have been heavily ploughed for decades, the lateral displacement of artefacts is limited and confined to the original medieval allotment. Finally, the integration of surface artefacts with geophysical anomalies and historical data enabled to enhance the spatio-temporal and functional interpretation of the sites.

04 BEYOND THE VIA APPIA: AN INTEGRATED APPROACH TO RECONSTRUCT MULTI-PHASE OFF-SITE LANDSCAPES IN CENTRAL ITALY

Author: Dr de Neef, Wieke - University of Groningen (Presenting author)
Co-Author: Dr de Haas, Tymon - University of Cologne; University of Groningen; Dr Tol, Gijs - University of Melbourne; Diplom-Geophys. Ullrich, Burkart - Eastern Atlas Gmbh &CoKG; Prof. dr. Sevink, Jan - University of Amsterdam
Keywords: Off-site landscapes, magnetometry
Presentation Preference: Oral

This paper discusses the merits of an integrated approach of field walking survey, geophysical prospection, and soil studies for the reconstruction of past landscapes in the Pontine Plain (Lazio, Italy). It builds on a substantial history of research in this area carried out within the framework of the Pontine Region Project, a joint research initiative of the universities of Groningen, Melbourne and Cologne. Earlier studies in this area consisted mainly of systematic field surveys, revealing a landscape dotted with small Roman (Republican) farms. More recently, magnetometry surveys on and around two Roman road stations along the Via Appia, Forum Appii and Ad Medias, showed the potential of integrating this technique into our approach to characterize these settlements, as well as the hydrological systems used to drain this wetland area. The latest installment of our studies, magnetometry survey and soil studies around small surface sites north of the Appia, again show the potential of this approach for unveiling off-site landscapes.
We illustrate our integrated approach with the results of pilot studies conducted in March 2014 and February 2017. We detected several canals and smaller ditches which may be interpreted as traces of a Roman land division, and pit-like magnetic anomalies spatially associated with diffuse Roman surface material. Targeted manual augering in several of these features reveal a more complex chronological picture: we now have evidence for a buried late prehistoric landscape which may have involved similar field management principles as the later Roman phase. Similarly, we also detected large circular anomalies which we think are the remains of 19th century fish basins. We would not have been able to reconstruct these artefact-less occupation remains without geophysical prospection; nor would we have guessed at their chronology without coring and dating of stratified samples and the study of local archives.

05 POLARISING RESULTS: FAILURES AND SUCCESS

Author: Ing. Orbons, Joep - ArcheoPro; Saxion University (Presenting author)
Keywords: Integrated approach
Presentation Preference: Oral

Let's polarise. Sometimes archaeological geophysics works, sometimes it doesn't. This presentation takes two examples: One failure with virtually no results and one example where geophysics and archaeology perfectly merge into a good result.

One is an example in an urban setting in the city of Maastricht where several prospection methods were used to find hidden fortifications. The urban situation is very complicated and produces some poor data but still somewhat usable results can be obtained. A success rate of 50% at best.

A second location is an industrial area under development on a confirmed stretch of the Roman Road Via Belgica. The site was surveyed with an EM31, EM38, Grad 601 magnetometry, RM15 ERT measurements, a 300 MHz GPR and augerings. The GPR data and the resistivity data give the best results clearly showing the location and state of preservation of the road.
The data gathered was used to plan the amount of soil that had to be brought onto the site and the depth and size of the water basins and road, so to disturb as little archaeology as possible. Only the deepest parts of the new sewers in the middle of the road would cut into the archaeological level. These deeper digging were excavated. In the excavation the Roman road, cremation burials and a fieldtracks were found.
Although the excavation was minimal, thanks to the geophysical surveys, a good reconstruction of the Roman road and the human structures could be made. And thanks to the process of "Archaeology-friendly building", most archaeology of the Roman road is still preserved In Situ.
This project has been labelled by the Dutch Archaeological Authorities as a "Best Practice" example for archaeological prospection surveys in The Netherlands.

06 ARCHAEOGEOPHYSICAL PROSPECTION AND PREVENTIVE ARCHAEOLOGY IN CENTRAL-EAST EUROPE

Author: Dr. Milo, Peter - Masaryk university Brno (Presenting author)
Keywords: geophysics, preventive archaeology
Presentation Preference: Oral

The combination of large scale geophysical prospection and preventive archaeology is still in the area of central-east Europe a new phenomenon. Only recently, places endangered by the construction activities started to be prospected in wider scale. This paradigm shift in the post- socialist archaeology is an outcome of several small changes. Better and available instrumentation at archaeological institutions and universities together with gradual generation change leads to new ideas, expectations in archaeology and gain more trust to the prospection methods. Subsenquential changes in heritage management measures resulted in necessity of geophysical prospection of the large areas affected by the construction activities. Possibility to assess an archaeological potential and to plan earthworks and logistic for the construction site in advance, is what makes advance geophysical prospection beneficial for both the archaeologist as well as the investor. Within last year's Department of Archaeology and Museology at Masaryk University Brno made several of advance geophysical prospection surveys in Czech and Slovak republic. Surveys were carried out in cooperation with several contract archaeology companies and clearly demonstrate the advantages of archaeogeophysical prospection conducted prior to the excavation itself. It also points out the weaknesses of the traditional excavation method used in the preventive archaeology.

07 THE POTENTIAL OF ELECTROMAGNETIC INDUCTION FOR DEVELOPMENT-LED ARCHAEOLOGICAL PROSPECTION WITHIN SEDIMENTARY LANDSCAPES.

Author: PhD Saey, Timothy - Universiteit Gent (Presenting author)
Co-Author: PhD Verhegge, Jeroen - Universiteit Gent; Laloo, Pieter - GATE Archaeology; Prof. Van Meirvenne, Marc - Universiteit Gent
Keywords: conductivity, paleo-topography, polder
Presentation Preference: Oral

A development-led archaeological evaluation of a 170 ha polder area, situated on the Western border of the Scheldt river, was conducted ahead of its conversion into a nature reserve as a compensation for the expansion of the Port of Antwerp. Within sedimentary landscapes, conventional archaeological evaluation techniques based on systematic trial trenching and hand coring are hampered by the burial depth and wet subsurface conditions. Moreover, diverse depositional layers occur at a different depth within the soil profile, which implies that these landscapes are characterized by a high lateral and vertical variability. An alternative evaluation strategy based on the application of multi-signal electromagnetic induction (EMI) surveying, complemented with a limited number of cone penetration testing (CPT) and core observations, was proposed. The integration of the multiple electrical conductivity EMI measurements allowed to reconstruct the complex stratigraphic sequence within the top 6 m. More specifically, this allowed for a 3D reconstruction of the buried prehistoric landscape, with focus on the transition between the Middle Holocene peat layer, which is situated below a range of Late Holocene estuarine sediments, and the underlying Pleistocene sand. This retrieved paleo-topographical information can be considered crucial for subsequent archaeological prospection as it allows indicating preferential zones for the archaeological trial trenching and guides efficient soil sampling to detect artifact scatters at the modelled depths. Furthermore, this analysis allowed to exclude zones with eroded peat from further prehistoric archaeological investigation. Apart from the stratigraphic information, the shallow EMI data provided clear signatures of subtle features which represent either Late to Post Medieval structures and intertidal features. Targeted trial trenching allowed to interpret these features as filled-in ditches, dikes, roads and more recent gullies. The results of this research clearly illustrate the importance of integrating EMI data within the archaeological evaluation of sites with complex soil stratigraphy.

08 A TALE OF COGNITIVE DISSONANCE: SOME REMARKS ON THE ARCHAEOLOGICAL EXPECTATIONS OF GEOPHYSICAL SURVEYS - A POLISH PERSPECTIVE.

Author: Mr Wroniecki, Piotr - University of Wrocław (Presenting author)
Keywords: Poland, geophysics, interpretation
Presentation Preference: Oral

Amongst the perceived limitations of non-invasive prospection techniques lies foremost the archaeological interpretation of geophysical or remote sensing data. On one hand many publications showcase extremely positive case studies, where beneficial soil conditions and preserved man-made structures allow detailed interpretations, linking geophysical responses with specific archaeological features, taxonomic units and chronological periods. On the other hand many surveys show a series of undistinguishable anomalies that may or may not be linked to past human activities forcing ambiguous translations of datasets. Whilst the first scenario can bring forth enthusiastic comments on the sense of digging at all, the latter is wherein lies the rub on the implementation and workflows of non-invasive approaches in all kinds of archaeological research.
The sense of infusing Polish archaeology with non-invasive approaches can be brought down to the questions that are asked. In a certain simplification these are usually (whether meaningful or not) "what is the chronology and culture of this site?" in academia and "what is the range of this site?" in CRM circles. Recent experiences have generated geophysical surveys which are variable, showing results from all over the spectrum, from heroic successes to valiant efforts all the way to spectacular failures. This situation, not reflecting the (wishful thinking) reality known from publications, has in my opinion factored a serious cognitive dissonance that stands behind the limited reliance and support of the Polish archaeological community for non-invasive techniques.
In this presentation I would like to explore this state of things, the causes, underlying problems and propose a discussion on possible remedies based on experiences gathered within the "Hidden Cultural Landscapes of the Western Lesser Poland Upland. Non-destructive methods applied to settlement studies" project (financed by the National Science Centre Preludium grant 2014/15/N/HS3/0171).

09 ARE WE THERE YET? ENVIRONMENTAL SETTINGS AND GEOPHYSICAL PROSPECTION

Author: Schneidhofer, Petra - Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology (Presenting author)
Co-Author: Tonning, Christer - Kulturarv Vestfold fylkeskommune; Nau, Erich - Norwegian Institute for Cultural Heritage Research; Trinks, Immo - Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology; Neubauer, Wolfgang - Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology; Draganits, Erich - Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology; Gansum, Terje - Kulturarv Vestfold fylkeskommune; Paasche, Knut - Norwegian Institute for Cultural Heritage Research
Keywords: Geoarchaeology, Geophysical prospection
Presentation Preference: Oral

Archaeological geophysical prospection has become an integral part of archaeological research and is increasingly implemented in strategies for the management of cultural heritage. In the last two decades, technical advancements have led to data sets of unprecedented scale and resolution, which allow in-depth investigations that go well beyond simply detecting archaeological structures.
The complex ways, in which environmental settings such as soil and sediment types, topography, vegetation cover, geology, geomorphology and climate influence geophysical studies, has been given much less attention. Yet, understanding these settings, their interaction with each other and how they affect different geophysical prospection methods is essential for a successful survey. Naturally, this also concerns small survey sites, but it is significantly more important for large-scale prospection approaches as these potentially cover areas with a wider range of different environmental settings.
In the paper presented, we will discuss the influence of environmental settings on geophysical studies on the technical, qualitative and interpretative level. Examples from case study sites in Norway will be used to demonstrate how important the systematic considerations of these information for both archaeological research projects as well as for cultural heritage management is. Finally, we will propose a workflow for the implementation of environmental settings into the prospection routines regarding survey design, data processing as well as interpretative mapping.

10 EXPEDITIOUS GEOPHYSICAL SURVEY OF SEVERAL RURAL SITES IN LATE ANTIQUE MALLORCA (BALEARIC ISLANDS, SPAIN)

Author: Ms Goossens, Lise - Eastern Atlas GmbH & Co. KG, Berlin, Germany (Presenting author)
Co-Author: Mr Meyer, Cornelius - Eastern Atlas GmbH & Co. KG, Berlin, Germany; Mr Sala, Roger - SOT Prospeccio arqueologica, Barcelona, Spain; Ms Ortiz, Helena - SOT Prospeccio arqueologica, Barcelona, Spain; Dr Mas Florit, Catalina - Joukowsky Institute for Archaeology and the Ancient World, Brown University, USA; Equip de Recerca Arqueològica i Arqueomètrica de la Universitat de Barcelona (ERAAUB), Spain; Prof Cau Ontiveros, Miguel Ángel - Joukowsky Institute for Archaeology and the Ancient World, Brown University, USA; Equip de Recerca Arqueològica i Arqueomètrica de la Universitat de Barcelona (ERAAUB), Spain; ICREA, Pg. Lluís Companys 23, 08010 Barcelona, Spain
Keywords: LateAntiquity, geophysics, Mallorca
Presentation Preference: Oral

This paper presents a textbook example on interdisciplinary approaches of non-invasive methods applied effectively and expeditiously on several sites to shed light on the complex and virtually unknown archaeological situation of late antique Mallorca. Favourable surface conditions and an interdisciplinary approach on interpreting different geophysical data sets have enabled a detailed interpretation that proved its value in the archaeological discussion.
During a three-day campaign in June 2016, four late antique sites in the countryside of the Balearic island of Mallorca were subjected to geophysical survey. The main objective of the investigation was to work towards a better understanding of the poorly documented late antique landscape by integrating non-invasive methods and interdisciplinary data interpretation. Based on surface findings, the rural sites of Firella, Can Maiol and Son Joan Jaume were preliminary identified as Roman settlements, possibly villae. The archaeological site of Son Peretó regards a known and partly excavated late antique basilica. Using the 7-probe fluxgate gradiometer array LEA MAX, magnetic measurements were executed on a large area on each site. Based on the first results of the magnetic investigation reviewed in the field, GPR measurements were carried out to examine selected areas of interest in detail by means of the IDS GPR system based on the Fast-Wave module. The investigated areas demonstrated excellent surface conditions with a negligible amount of sources of disturbance, permitting a detailed interpretation of the geophysical data. Both data sets were initially treated separately to be assembled later and synthesised for each site. On all four sites, with various preservation levels, indications of architectural remains and functional deposits were encountered, substantiating the postulated hypothesis stating that the sites underwent a transformation and a continuation through Late Antiquity.

11 3D GPR-MAPPING SURVEY IN A ROMAN MARITIME VILLA ON THE EASTERN IBERIAN COAST: A TOOL FOR ARCHAEOLOGICAL WORK PLANNING

Author: Prof García, Francisco - Universidad Politecnica de Valencia
Co-Author: Prof. Melchor, José Manuel - Universidad Jaime I (Presenting author); Prof. Benedito, Josep - Universidad de Valencia; Prof Buchón, Fernando - Universidad Politecnica de Valencia
Keywords: Roman Villa, GPR
Presentation Preference: Oral

Roman maritime villa phenomenon spread throughout Italian territory by the late second century B.C. But it was restricted to specific sectors of the Spanish coast, specially on the Eastern Iberian Coast. This paper describes a ground-penetrating radar (GPR) survey performed on the Roman maritime villa of Sant Gregori, located on the northern coast of Burriana city, Eastern Iberian Coast (Spain). The northern coast of Burriana is a low and rectilinear strip, formed by a succession of alluvial fans as a result of combined actions of the marine-fluvial dynamics. The archaeological surveys carried out previously allowed to know the prelimirary characteristics of its location on the coastline, the organization of some of buildings and their dating (I-IV centuries A.C.). Archaeological excavations have made it possible to ascertain that the residential part of this maritime villa is located at the north-east end of the site and residential buildings are set up precisely on the Mediterranean, practically at sea level. The main objective of this study is to improve decision-making in planning of further archaeological works on this maritime villa using a 3D GPR-mapping technique. A 3D GPR-mapping pinpointed new buried structures related to this coastal establishment, such as walls and floors at a maximum depth of 1.5 meters. Furthermore, geophysical analysis combined with archaeological prospecting has defined that the villa was built right on the ancient shoreline. Thus has been determined the coastal limit of this Roman archaeological site that is located about 55 m from the current waterfront. The 3D GPR-mapping accuracy obtained in pinpointing subsurface structures and defining their geometry provide additional information to design and perform further archaeological prospections on this Roman maritime villa by minimizing potential errors, optimizing their resources and increasing effectiveness of excavations and results.

12 AN INTEGRATED EXCAVATION AND GEOPHYSICAL PROSPECTION APPROACH - WHAT CAN BROAD BAND MAGNETIC SUSCEPTIBILITY DO FOR US?

Author: Kainz, Jakob - University of Vienna; LWL - Archäologie für Westfalen (Presenting author)
Keywords: multi-geophysics, broad-band-magnetic-susceptibility, excavation
Presentation Preference: Oral

The paper outlines an approach combining archaeological excavation with geophysical prospection (magnetometry, magnetic susceptibility, ground penetrating radar) on archaeological features before and during excavation. The focus especially is on broad-band-magnetic-susceptibility (BBMS) measurements of soil samples, which allows quantifying a narrow grain size distribution (GSD) of superparamagnetic grains (SP) based on their frequency-dependency. Usually low field magnetic susceptibility (MS) measurements are a common technique used in geological, rock, palaeomagnetic, and environmental studies as these indicate the concentration of magnetic minerals in samples. A material's magnetic GSD or its magnetic minerals can be investigated using a variety of methods. The GSD provides useful information relating to the ultrafine magnetic particles, SP grains, which contribute most to a material's magnetic properties. Although novel in archaeology, such measurements have been applied in a handful of environmental studies in recent years concerning loess deposits in China and Bulgaria as well as different kinds of samples in a study from the Czech Republic. In order to assess the applicability of BBMS in archaeology, samples were taken during the excavation of a Circular Ditched Enclosure (Kreisgrabenanlage) (University of Vienna) situated in the Kreuttal case study area of the Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology. The samples were measured with the University of Toronto Electromagnetic Induction Spectrometer (UTEMIS II). This permitted measurements at different frequencies, ranging between 0.14 - 63 kHz, allow the calculation of the samples' GSD's, the grain sizes' mean, standard deviation and range and the frequency dependence. The results of the study show promise in BBMS being a useful tool for differentiating different soils and sediments and thus reflecting the archaeological and stratigraphic phases and soil formation processes. This provides for a better understanding of the life history of the features and allows for further archaeological assessment.

13 WATER AND AIR: GPR DAMAGE DETECTIONS IN ARCHAEOLOGICAL AND CULTURAL HERITAGE

Author: Professor Barone, Pier Matteo - The American University of Rome (Presenting author)
Keywords: GPR, Moisture, Cracks
Presentation Preference: Oral

Fractures with millimeter apertures filled with moisture and/or air cause the most important damages in the preservation and integrity of archaeological and cultural heritage. Geophysical non-destructive techniques (NDTs), such as Ground Penetrating Radar (GPR), use electromagnetic (em) impulses to investigate archaeological sites and ancient building structures affected by fractures related to moisture and/or air cracks. They can be used to locate and to estimate the extent of damage and to develop restoration plans before permanent damage occurs. The main goal of this presentation is to introduce the capacity of surface GPR to rapidly and non-invasively estimate physical soil properties, develop novel processing strategies and provide valuable information about the investigated material in archaeological and cultural heritage sites. This new approach analyzes the amplitude attributes of the GPR pulse obtained from conventional single-offset surface-coupled profiling. To achieve the aim of this study, the technique is examined in different test areas to show that GPR analyses clearly highlight stronger GPR reflections and more diffractions related to these two physical phenomena. These indicators are important for diagnosing archaeological and cultural heritage sites by allowing for the correct and precise visualization
of anomalies in radargrams and time-slices.

14 RECENT DEVELOPMENTS IN INTEGRATED STUDIES OF THE EARLY IRON AGE SITES AND LANDSCAPES BETWEEN THE ALPS AND THE PANNONIAN PLAIN

Author: Assist. Prof. Dr. Mušič, Branko - University of Ljubljana, Faculty of Arts
Co-Author: Assist.Prof.Dr. Cresnar, Matija - University of Ljubljana, Faculty of Arts; Institute for the Protection of Cultural Heritage of Slovenia (Presenting author)
Keywords: integrated-studies, Early-Iron-Age, Slovenia
Presentation Preference: Oral

The integrated studies, combining a broad array or research techniques and methods, focussed mainly on the investigations of Early Iron Age sites and landscapes in Slovenia and Croatia, have in the recent years made at least a few steps forward.
Our primal goal was neither to pile vast amounts of data, nor to understand one feature, one site, or one region, but to develop a "methodical toolbox", which could be, due to its systematic nature, applied (almost) anywhere.
For basic understanding research areas, we have studied ALS derived data. The next step we took was a geological and geomorphological field survey. The "ground truthing" of the identified features, natural or anthropological, was then conducted to determine the areas for intensive geophysical surveys, using a range of different techniques and analytical methods, covering wide areas of settlements and their surroundings, including iron working areas, flat cremation cemeteries or barrow cemeteries. Our survey incorporated the magnetic method using measurements of total magnetic field by applying corrections of diurnal variations using base station as well as magnetic prospection in gradient mode, GPR method from very low to high frequencies (50–400 MHz), low frequency EM method and measurements of top soil magnetic susceptibility. Furthermore, we have introduced the electrical resistivity tomography (ERT) that adds another dimension to our investigation (similar to GPR) and reveals/identifies underground structures not detectable with other geophysical methods. Furthermore, we have included the geochemical mapping (pXRF) into our research.
Low- and medium-invasive archaeological methods (e.g. drilling or test-trenching) were then applied on crucial locations, to help understanding and re-evaluating previous results and assumptions.
Intensive cooperation "forced" us into transdisciplinary research, where we had to combine and intertwine our knowledge to produce common results; which are therefore not only a sum of the included data, but rather its multiplied product.

369 CULTURES OF THE PLEISTOCENE-HOLOCENE TRANSITION IN WESTERN EUROPE

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Roman, Didac (Spain) - University of Barcelona/SERP
Co-Author(s): Langlais, Mathieu (France) - CNRS PACEA UMR 5199, Université de BordeauxFat
Cheung, Célia (France) - TRACES UMR 5609. Université Toulouse Jean Jaurès
Keywords: Pleistocene-Holocene Transition, Tardiglacial, Lithics, Economy,
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

In the last few years several research projects focusing on the origins and development of cultures of the Pleistocene-Holocene transition (ca. 14000-10500 cal. BP) have been conducted in Western Europe. These projects seek to order, at a regional level, the large cultural mosaic that seems to develop in Europe from GI-1 (Bølling-Allerød Interstadial). Different terms have been used so far to define these industrial complexes: Azilian, Epimagdalenian, Epipalaeolithic, Laborien, Epigravettian, Ahrensbourgian, Swiderian, Federmesser, etc. Despite this apparent diversity and a clear regionalization, some elements may be telling indicators of an extensive dissemination of ideas. Stone tools, such as, for example, backed and truncated points (Malaurie type), arched backed points (Azilian types) or the appearance of the first geometric or bitruncated tools (trapezes, triangles or lunates) could suggest closer relationships among these cultures than previously thought.
Additionally, about 14000 cal. BP there is a replacement of animal species of glacial origin by those of temperate climates. From then on, several climatic phases will impact on humans and their economic practices, so we would like to explore how these changes affect both the economy and the industries.
This session aims to offer a meeting point for those researchers working on the development of post-Magdalenian cultures from industrial and/or economic perspectives. Pooling research results and expertise in Western European territories we aim to advance knowledge on our understanding of both the spread and extension of these cultures as well as the regional specificities developed during the Pleistocene-Holocene transition.

01 INTRODUCTION: CULTURES OF THE PLEISTOCENE-HOLOCENE TRANSITION IN WESTERN EUROPE

Author: Dr. Roman-Monroig, Didac - SERP/University of Barcelona (Presenting author)
Co-Author: Dr. Fat Cheung, Celia - TRACES UMR 5609. Université Toulouse Jean Jaurès; Dr. Langlais, Mathieu - CNRS PACEA UMR 5199, Université de Bordeaux
Keywords: Pleistocene-Holocene Transition
Presentation Preference: Oral

In the last few years several research projects focusing on the origins and development of cultures of the Pleistocene-Holocene transition (ca. 14000-10500 cal. BP) have been conducted in Western Europe. These projects seek to order, at a regional level, the large cultural mosaic that seems to develop in Europe from GI-1 (Bølling-Allerød Interstadial). Different terms have been used so far to define these industrial complexes: Azilian, Epimagdalenian, Epipalaeolithic, Laborien, Epigravettian, Ahrensbourgian, Swiderian, Federmesser, etc. Despite this apparent diversity and a clear regionalization, some elements may be telling indicators of an extensive dissemination of ideas. Stone tools, such as, for example, backed and truncated points (Malaurie type), arched backed points (Azilian types) or the appearance of the first geometric or bitruncated tools (trapezes, triangles or lunates) could suggest closer relationships among these cultures than previously thought.
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02 HAMBURGIAN SOCIETIES IN WESTERN POLAND - LITHIC TECHNOLOGY AND SETTLEMENT SYSTEM

Author: Mugaj, Jakub - Institute of Archaeology and Ethnology Polish Academy of Science (Presenting author)
Keywords: Hamburgian, technology, settlement
Presentation Preference: Oral

The first inhabitants of European plain after deglaciation, related to Hamburgian Culture, colonized vast area from the Netherlands at west to the Poland at east at the very beginning of Late glacial. The magdalenian origin of hamburgian societies was a subject of analysis throughout the history of the Late Paleolithic research. Nowadays the close relationship raises no doubts. The paper present new analysis of lithic inventories from Polish hamburgian sites conducted using refitting method. Based on refittings the lithic technology of hamburgian societies will be reconstructed and the aspect of spatial organization and settlement mobility will be examined as well. The analyses will focus particularly on issues of traces of the magdalenian tradition and diversity within the Hamburgian Culture.

03 THE TRANSITION PLEISTOCENE-HOLOCENE IN SOUTHWESTERN FRANCE: NEW DATA FROM "LABORIAN PROJECT"

Author: Mr Langlais, Mathieu - PACEA UMR5199 Univ. Bordeaux; SERP Univ. Barcelona (Presenting author)
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Keywords: Western-Europe, Lateglacial, Laborian
Presentation Preference: Oral

The South-West of France is characterized by contrasting landscapes containing numerous sites from the Pleistocene-Holocene transition. During this period, the Laborian, occupies an area at the crossing of northern traditions (Ahrensbourgian) and the Epigravettian techno-complex. Situated between the Azilian and Mesolithic, the Laborian is, paradoxically, poorly defined in southwestern France where it was initially observed. The revaluation of key Laborian lithic assemblages as well as the discovery of new sites paint a new picture of the various cultural traditions occupying this large area around 12000 cal. BP. Neglected for some time, this large region has recently become the focus of an important research dynamic and now plays a critical role in our understanding of the Younger Dryas (GS-1) – Preboreal transition in Western Europe. Lithic hunting weaponry essentially based around point forms, much like during the Azilian, allow two chronological phases of the Laborian to be identified. In addition to adding chronological structure to Laborian industries, these lithic projectiles also allow interactions between the various contemporaneous European traditions during this period to be explored. The production of large, standardized, straight blades with flat cross-sections during the Laborian reveals clear similarities with concepts defined in northern regions even if blade lengths rarely

reach the standards known on these sites. While lithic assemblages provide the majority of information concerning this period, other form of evidence are also instructive. The exploitation of large game typical of open temperate landscapes, the maintenance of bone barbed points or artistic conventions (engraved pebbles) along with several symbolic innovations, such as the development of a unique zoomorphic art, are among important elements that shed light on these societies. The goal of our approach is to mobilize these various technological, economic and symbolic aspects to investigate the identity of human groups occupying western France during this transitional period.

04 THE LATE UPPER PALAEOLITHIC IN FRENCH PYRENEES (LITHIC PERSPECTIVES)

Author: Mrs Fat Cheung, Celia - TRACES UMR5608 Univ. Toulouse (Presenting author)
Keywords: Pyrenees, Azilian, Laborian
Presentation Preference: Oral

This presentation is based on recently defended PhD dissertation dealing with Late Upper Palaeolithic (Azilian and Laborian) lithic industries of French Pyrenees. The results obtained were then compared to other contemporaneous assemblages (outside of Pyrenees) in order to get a larger and clearer picture of this period. Since its discovery at the end of 19th century, the Azilian was characterized by its specific lithic industry (baked points), osseous artefacts (harpoons) and artistic remains (painted pebbles). However, new discoveries shed some new light on the character and dynamics of Azilian. This work deals with lithic industry in order to question its regional character and its relation other chrono-cultural data. Six lithic assemblages were examined: Rhodes II (Ariège), Troubat (Hautes-Pyrénées), La Tourasse (Haute-Garonne), Le Poeymaü (Pyrénées-Atlantiques), Gouërris (Haute-Garonne) and Pagès (Lot). This study allows to question the evolution of Azilian and Laborian culture. Finally, we're observing the Azilian phenomenon in larger perspective by comparing the French facies with those of Western Europe. The development of Azilian in the Pyrenees differs from the situation observed in the "azilianisation phase" of the northern sites as the Magdalenian persist until 14 200 cal. BP and the transitional phase is actually lacking. However, during the younger phase some common traits are identified on the larger territory (France, Pyrenees, Cantabria) marked in particularly by a technological simplification. Still, the Pyrenean Azilian (between 14 200 and 12 500 cal BP) preserves its regional particularity as seen in its lithic industry characterized by double backed points, little scrapers and use of anvil in percussion. The Laborian, sporadically present in the Pyrenees, might indicate the return of "technological normalisation" characterized by more regular and straight production. This "technical renewal" will soon characterize the whole western Europe around 12 300 cal. BP.

05 THE LITHIC INDUSTRIES WITH GEOMETRICS OF THE PLEISTOCENE / HOLOCENE TRANSITION: THE CASES OF ATXOSTE AND PEÑA 14 (SPAIN)

Author: Soto, Adriana - University of Basque Country; TRACES, UMR-5608, University of Toulouse Jean-Jaurès (Presenting author)
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Keywords: Lithic, technology, Sauveterrian
Presentation Preference: Oral

In recent years the advance of prehistoric research in the Ebro valley has allowed the identification and excavation of numerous archaeological sequences of the Pleistocene / Holocene transition. As a result, the vision of these interior territories has changed significantly, revealing the existence of a relatively intense and continuous occupation from the last paleolithic societies to the first neolithic communities. In this context, one of the main lines of research concerns the complexity of industrial realities that were developed between the end of the Allerød (GS-1) and the early Preboreal. Due to this complexity the use of a diverse nomenclature -Azilian, Microlaminar Epipaleolithic or Epimagdalenian- is usual, although their discriminatory criteria are not always evident. In addition to this, recent identification of industries with geometric microlites is carried out in the region. Considering the typological similarity with the projectiles from the first Mesolithic of the north of the Pyrenees, they have been defined as sauveterrian industries, although it continues being unknown which kind of connection exists between both industries.
In this state of knowledge we present the main results from the study of raw materials, technology and typology of the sauveterrian levels from two upper and middle Ebro sites: Atxoste (Basque Country) and Peña 14 (Aragon). Production and management strategies reconstruction of the lithic industry allows us to: a) offer an initial characterization of these industries with geometric in the upper and middle Ebro; and b) analyze the possible space-time variability between both collections.

06 EXPLORING THE END OF THE UPPER MAGDALENIAN IN NORTHERN VALENCIAN REGION (MEDITERRANEAN IBERIA).

Author: Dr. Roman-Monroig, Didac - SERP/University of Barcelona (Presenting author)
Co-Author: Dr. Domingo, Inés - ICREA/Universitat de Barcelona/SERP
Keywords: Epimagdalenian, stone-tools, rock-art
Presentation Preference: Oral

In the last few years several research projects focusing on the origins and development of cultures during the Pleistocene-Holocene transition (ca. 15000-11500 cal. BP) have significantly changed our view on human occupations in the region of Castelló (northern Valencian region). These projects seek to order, at a regional level, the cultural mosaic that seems to develop in Mediterranean Iberia during this period. To do so we have conducted several excavations and analyzed the rock art imagery of the area. The results offer interesting insights to explore continuities and changes at the time and to define the characteristics of the evolution of the Epimagdalenian.
Analysing this evolution we have been able to identify a new facies in the Magdalenian-Epimagdalenian transition, based on the lithic tools, and the continuity of the figurative art of Palaeolithic tradition up to 11500 cal. BP.

07 LITHIC PRODUCTION AND SUBSISTENCE STRATEGY IN THE PLEISTOCENE-HOLOCENE TRANSITION. DATA FROM COVES DE SANTA MAIRA (IBERIAN MEDITERRANEAN REGION, ALICANTE, SPAIN)

Author: PhD student Vadillo Conesa, Margarita - Departament de Prehistòria Arqueologia i Història Antiga. Universitat de València (Presenting author)
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Keywords: techno-economy, subsistence strategies
Presentation Preference: Oral

The Pleistocene-Holocene transition is considered a turning point between cold Tardiglacial environmental conditions and the warmer Holocene. According to palaeobotanical data, the evolution of the coastline and other proxies these changes were important. However, there was greater continuity in animal communities than in other more northern

regions. The persistence of Palaeolithic cultural traditions into the early Holocene supports the use of the term "Epipalaeolithic" to describe this process in much of the Iberian Mediterranean region. Discussion of techno-economic and subsistence strategies in human groups is based on the combined use of lithic production systems and faunal exploitation analysis.
We introduce data from the archaeological site Coves de Santa Maira. During the blade-microbladelet phases, the assemblages are described as Final Magdalenian, Epimagdalenian and Epipalaeolithic (14 -10 ky cal BP). These occupations show the use of local/regional resources. The abundance of Capra pyrenaica shows this behaviour because the site is situated in a mid-mountain environment. Moreover, the use of mainly local lithic raw material shows exploitation of the surroundings. The data also show the absence of breaks in relation to the fast climatic changes. Ibex and rabbits dominate the faunal record, while microbladelet production systems characterize the lithic industry. The ultimate purpose does not change over time (mainly armature and endscrape production), although certain diachronic changes need to be analyzed.
The real break came with Mesolithic occupations (10 ky cal BP). At this time, economic strategies and modifications in the procurement and use of lithic resources show clear differences with respect to the Epipalaeolithic. Despite the dominance of ibex, there are changes in ungulate composition due to an increase in minority taxa and a significant decrease in rabbits. Microbladelet lithic production was replaced by expedient production systems, mostly to obtain flakes, and a strong increase in local resources like limestone is observed.

08 ON THE SHORE OF MEDITERRANEAN SEA. THE END OF THE PALAEOLITHIC ON THE COAST OF MÁLAGA

Author: Dr Cortés Sánchez, Miguel - Departamento de Prehistoria y Arqueología. Facultad de Geografía e Historia, Universidad de Sevilla, c/. Doña María de Padilla s/n. 41004. Sevilla
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Keywords: Andalusia, Magdalenian, Symbolism
Presentation Preference: Oral

The coast of Malaga constitutes a key territory for documenting the end of Palaeolithic times in the westernmost corner of the European continent. An overview of the economic, cultural and symbolic models documented in settlements from this region is presented. Along with it, some of the main questions that will help frame research in this area are entertained. Lastly, the use of the coastal fringe is discussed from the standpoint of mobility and economic strategies from southern Iberia, taking into account the hinterland and Guadalquivir basin territories.

372 RE-ENGINEERING THE PROCESS: HOW BEST TO SHARE, CONNECT, RE-USE AND PROVIDE ACCESS TO ARCHAEOLOGICAL INFORMATION.

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: May, Keith (United Kingdom) - Historic England; Visiting Research Fellow, University of South Wales
Co-Author(s): Degraeve, Ann (Belgium) - Responsable Département Patrimoine archéologique Direction des Monuments et des Sites
Keywords: Amersfoort, data, digital technologies
Presentation Preference: Session with papers of six minutes and six slides

One challenge resulting from the EAC 2014 Amersfoort Agenda (http://www.europae-archaeologiae-consilium.org/eac-occasional-papers) is to consider what is necessary for the re-design, or re-engineering of, fieldwork, analysis, synthesis and publication along with related management processes to best enable appropriate access to digital historic environment information. Where possible this should be an opportunity to research and design direct digital data capture in the field using appropriate digital methods (e.g. digital field recording, remote sensing, data analytics and publication, etc.) and all with potential to be implemented and shared using online Internet technologies. Amersfoort set out 3 key areas for research and related activities using digital technologies and associated methods and this session will draw together short position papers on those 3 key themes of:

- 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 focus discussions on what can be done to enable better and more open data sharing while maintaining and increasing the best contacts across Europe around the related issues of Information Standards in Heritage.

01 SHARING, NOT RE-INVENTING, THE WHEEL? OPEN ACCESS OPPORTUNITIES AND ISSUES.

Author: May, Keith - HE - Historic England; University of South Wales - Visiting Research Fellow (Presenting author)
Keywords: Digital, Open, Sharing
Presentation Preference: Oral

The recent EAC publication on 'Digital Archaeological Heritage' (https://doi.org/10.11141/ia.43.1) raised a number of significant challenges arising from the use of information technologies in archaeological work across Europe. Not least is that the technologies are increasing the range and scale of archaeological information that is produced in digital formats and that the growing availability of this digital information increases the opportunities for greater data sharing and cooperative research.

Examination of the EAC Amersfoort Agenda (Schut et al. 2015) suggests that sharing of archaeological information is a key strategic target for improving not just the access to information for further research but also raises the quality of that information by enabling more opportunities for synthesizing the data and information.

One particular challenge is in the area of "Open access to data and publications supporting data sharing and re-use". The broader directives towards Open Data, and Open Access publishing (https://ec.europa.eu/digital-single-market/en/news/open-innovation-open-science-open-world-vision-europe) and Open Science (http://ec.europa.eu/research/openscience/index.cfm), along with the emergence of widely used Open Source software are providing a new impetus to data sharing and more open research opportunities.

This presentation will look at some of these challenges along with approaches to how they might be addressed, particularly focusing on issues around sharing and openness of archaeological and heritage data.

02 DIGITIZING EARLY FARMING CULTURES (DEFC): CONVERTING, BROWSING AND SHARING ARCHAEOLOGICAL LEGACY DATA

Author: Aspöck, Edeltraud - Austrian Academy of Sciences, Institute for Oriental and European Archaeology
Co-Author: Štuhec, Seta - Austrian Academy of Sciences, Institute for Oriental and European Archaeology (Presenting author); Zaytseva, Ksenia - Austrian Academy of Sciences, Austrian Centre for Digital Humanities; Andorfer, Peter - Austrian Academy of Sciences, Austrian Centre for Digital Humanities
Keywords: database, data sharing
Presentation Preference: Oral

Every day new research projects generate new archaeological data that needs to be curated. However, one should not overlook a great amount of valuable legacy and archive archaeological data. These are often hidden in analogue resources such as publications and grey literature (excavation reports), which make it difficult to browse and share the data. Other challenges are different types of data carriers and formats that prevent interoperability and further impede accessibility of the data.
In this paper we present an online open access database called DEFC app that is a work in progress of Digitizing Early Farming Cultures (DEFC) project - https://defc.acdh.oeaw.ac.at/. The database includes information extracted from several publications as well as (so far) unpublished work containing excavation and other archaeological reports on Neolithic sites in Greece and Anatolia. The app enables browsing, filtering and downloading of the data, spatial visualization of the sites, and includes a 3D gallery of representative pottery sherds from the Fritz Schachermeyr pottery collection that are interlinked with the database. Furthermore, the DEFC app homepage includes video content that is unlike the database content more noticeably directed also to the layman public.
For the purpose of data integration and standardization of the data, the database complies with existing standards and guidelines, containing controlled vocabulary and providing a thesaurus. Further work will focus on interoperability and linked open data by mapping the database to CIDOC CRM, storing the data in a triple store and enabling data querying via SPARQL endpoint.

03 LINKING RESEARCH THROUGH HERITAGE STANDARDS – THE ROLE OF FISH

Author: Archaeologist Miles, Daniel - HE - Historic England (Presenting author)
Keywords: data standards FISH
Presentation Preference: Oral

This short presentation will provide an overview of the role of the Forum on Information Standards in Heritage (FISH) and the importance that data and information standards have in the UK heritage sector. This is from the development of Historic Environment Record databases, linking, cross searching and making these publically available to enabling the effective reporting of investigation information and the creation and management of knowledge through Research Frameworks. Data standards are now de facto established in the UK and are more and more recognised as being the cornerstones of research and the creation and dissemination of information and knowledge. FISH is represented by heritage information specialists from across the UK and plays an essential role in developing and maintaining these standards as well as promoting their implementation and value to the sector as a whole. Discussion leading on from this presentation will focus on engaging other European standard setting organisations and groups and looking at how collaborative working between these can be promoted.

04 ATHENA - A HISTORICAL DATABASE ON FLORA AND FAUNA SPECIES IN CULTURAL AND NATURAL CONTEXTS FOR THE NETHERLANDS

Author: MA Van der Jagt, Inge - Cultural Heritage Agency of the Netherlands (Presenting author)
Co-Author: Dr. Lenders, Rob - Radboud University Nijmegen; Dr. Goethem, Thomas - Radboud University Nijmegen; Dr. Lauwerier, Roel - Cultural Heritage Agency of the Netherlands; Dr. Brinkkemper, Otto - Cultural Heritage Agency of the Netherlands
Keywords: portal, historical, ecological
Presentation Preference: Oral

Studying the processes in which people transformed their surroundings and the ways in which the natural world has influenced the course of human history is important to understand the current state of human-nature relationships. Such relationships can best be studied on the basis of comprehensive temporal (and geographical) explicit datasets. Currently, however, data and datasets are scattered or even lacking. Moreover, the data that is available is generally missing historical, social, cultural and ecological context. To address this situation, historians, archaeologists and ecologists must come together to share and combine data. The goal of the ATHENA project is to produce and maintain a unique database that allows researchers from multiple scientific disciplines to study human – nature relationships in an interdisciplinary setting. ATHENA will however not only be available for scientific purposes. The database will also be freely accessible for the broad public and for providing policy makers and managers with invaluable information for decision making. The use of the database is illustrated with the research on the relation between the historical rise of waterpower and the collapse of salmon stock.

05 MAXIMISING POTENTIAL - THE NEED FOR A SPATIAL DATA INFRASTRUCTURE FOR THE HERITAGE ENVIRONMENT.

Author: Mr McKeague, Peter - Historic Environment Scotland (Presenting author)
Keywords: Spatial Data, Inventories
Presentation Preference: Oral

Heritage professionals create or use spatial data on a daily basis across a range of processes from desk-based assessments, remote sensing techniques and field survey to excavation. Objects in museum collections and the results of scientific analysis also have an inherent spatial relationship derived from location.
Brought together, results from diverse data sources and projects combine to form the evidence base to support a range of decision-making processes, including formal protection of the heritage, applying conditions as part of the planning process, asset management, academic and personal research and increasingly for public engagement.
Despite the wealth of spatial data collected, co-ordination is lacking and the value of information not being realised. This presentation will argue the case for realising the untapped potential of the spatial data archaeologists create. It will highlight the benefits of coordinating data collection through publication on web portals and as web services that can be shared both within and beyond the heritage sector. However, to realise that potential requires co-ordination, data standards and an infrastructure to collate, manage and deliver spatial data to existing and new audiences.

06 HOW CAN WE REALLY MANAGE OPEN DATA SOURCES?

Author: Prof. Dr. Jerem, Elizabeth - Archaeolingua Foundation and Publishing House; Institute of Archaeology, Research Centre for Humanities of HAS (Presenting author)
Keywords: open data, publication
Presentation Preference: Oral

The debate around the efficient management of open access data sources and their integration into research is still ongoing in Central Europe. In Hungary, there are existing practices to handle large-scale archaeological data, for instance, in the successful and user-friendly archaeological database of the Hungarian National Museum that catalogues and manages data nearly 60.000 archaeological sites in Hungary (http://archeodatabase.hnm.hu/). This, in fact, is a third of possible archaeological sites in the country. The problems concern the distribution and the maintenance of data and keeping the records up-to-date and accessible. This "National cadaster" will be supplemented by data of 'MRT' since the digitization of the Hungarian Archaeological Topography is in progress.
There are lots of further, positive examples in the region, for instance, the recently launched Interreg project (Iron Age-Danube) that has a clearly articulated aim to share data between partners and produce open access publications. The formation of a networking, common vocabulary and work on selected archaeological sites, integration of each others' results is an important model for useful collaboration. Crossdisciplinary data sharing will be implemented.
There is an awareness of the importance of open source data in all levels, however, these databases are not regularly used by our scholarly community. More effort is needed in public archaeology, teaching, organising courses, i.e. making the results more well known. Archaeologist should recognize the importance of having a common database and a methodology to handle it because not even existing datasets are regularly used. Further on we still need to develop new standards for archivation and promote digital recording at excavations
HAS just introduced to support and create rules for open access publications which can reach a very high number of readers and in fact, can be also used as a basis for traditional publications, the latter ones still maintained their relevance.

373 LANDSCAPES THROUGH THE LENS OF LARGE-SCALE GEOPHYSICAL SURVEYS: BIG DATA, BIG OPPORTUNITIES, AND BIG CHALLENGES

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Darvill, Timothy (United Kingdom) - Bournemouth University, UK
Co-Author(s): Lueth, Friedrich (Germany) - German Archaeological Institute, GermanyRuby, Bret (United States) - Hopewell Culture National Historical Park, USA
Keywords: Landscape archaeology, large-scale geophysics
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

This session focuses on the methodologies and approaches used in undertaking large-scale geophysical surveys of archaeological landscapes, showcasing results from recent work in different parts of Europe and beyond. Landscape-scale geophysical surveys are becoming increasingly cost-effective due to recent advances in instrumentation and represent an area of rapid growth as a result of improvements in the scientific underpinnings and improved instrumentation. The availability of multi-sensor arrays and real-time positioning systems in particular permits us to widen our field of view and place individual features, sites, and monuments in their broader context. In some cases these studies have been applied to areas of well-known and previously well-studied archaeology, in other cases work has focused on areas that have previously received little attention. In all cases the results can be surprising, and often add rich texture and detail to the archaeological record, providing opportunities for novel interpretations, extensive data-sets useful for resource management, and mapping that can lead to greater public appreciation of the sites and deeper engagements with local communities. At the same time, the scale of these data-sets presents new challenges for data processing, analysis, visualization, handling, manipulation, and storage. This session will explore these issues with a view to advancing archaeological theory and practice in step with advances in archaeo-geophysical instrumentation. It is hoped that the session will feature an international team of participants, promising new perspectives and broader contexts for our understanding of ancient landscapes.

01 PREHISTORIC LANDSCAPE AROUND THE HENGE MONUMENT AT AVEBURY, WILTSHIRE (UK) – LOOKING BETWEEN THE MONUMENTS

Author: Professor Lüth, Friedrich - German Archaeological Institute, Germany (Presenting author)
Co-Author: Professor Darvill, Timothy - Bournemouth University, UK; Dr Snashall, Nicola - National Trust; Dr Fischer, Andreas - SENSYS Sensorik und Systemtechnologie GmbH, Bad Saarow, Germany
Keywords: Magentometry, Avebury, Prehistory
Presentation Preference: Oral

One of the early archaeological sites of outstanding universal value, listed on UNESCO´s list of World Heritage, at Avebury in Wiltshire (UK) is getting more and more attention from the public. Although the entire protected area around the henge monument is already well-known through long-term surveys there are questions about what the relation of

groups of monuments are to each other and whether the areas in between the monuments were used or not. Distribution maps of surface finds show settlement activity for later periods, but there is little detail about what the surface finds tell us about the prehistoric landscape.

Extensive magnetometry is being applied to investigate the quality of preservation at archaeological remains with few if any visible surface features, to investigate the areas between the monuments and to help to understand the impact of on-going agricultural activities.

02 A GEOARCHAEOLOGICAL APPROACH TO GEOPHYSICAL LANDSCAPE ARCHAEOLOGY AT STONEHENGE.

Author: Dr. De Smedt, Philippe - Ghent University (Presenting author)
Co-Author: Dr. Chapman, Henry - University of Birmingham; Mr. Garwood, Paul - University of Birmingham
Keywords: geoarchaeology, electromagnetics, Stonehenge
Presentation Preference: Oral

Geophysical prospection is developing rapidly in archaeology, most notably through the motorization of prospection systems and the consequent transition from site to landscape scales of study. This areal expansion not only increases detection potential but aids in understanding the archaeological evidence and its relationship with the natural environment.
There are, however, downsides to scaling up. All geophysical methods have certain limitations that are exacerbated by increased survey scale and mobility. Most important are the fundamental challenges that stem from the nature of our research and the way in which we approach it. In particular, we try to understand past societies by recording and analysing geophysical expressions of subsurface phenomena, yet these are the products of complex combinations of natural variations, past and recent natural and anthropogenic processes, and deliberate social actions. In many respects, the interpretation of such geophysical data seems more like an art form than a reproducible scientific process, and the interpretative ambiguities that result tend to increase and diversify as the scale of surveys increase.
Within the framework of recent large-scale electromagnetic induction surveys at Stonehenge, we have developed an approach to address these interpretative issues. Electromagnetic induction data inform on 3D electrical and magnetic soil variations, providing a broad basis for researching a wide range of distinct geological, pedological, and anthropogenic features. These data alone, however, lack the potential to resolve our interpretative constraints. We therefore complemented the geophysical dataset with lithological, archaeological and geophysical coring and other invasive investigation.
The methodology presented shows how limited invasive research can help bridge the gap between data and interpretation, even at landscape scales of study. It also underlines the need to consider natural soil variations and the impact of recent disturbances, to help distinguish different kinds of past processes and practices within ancient landscapes.

03 RECONSTRUCTING A NEOLITHIC LANDSCAPE AT ABBEY HOME FARM, CIRENCESTER, UK, THROUGH EXTENSIVE MAGNETOMETRY

Author: Professor Darvill, Timothy - Bournemouth University, UK (Presenting author)
Co-Author: Professor Lüth, Friedrich - German Archaeological Institute, Germany; Dr Fischer, Andreas - SENSYS Sensorik und Systemtechnologie GmbH, Bad Saarow, Germany
Keywords: Cirencester, Magnetometry, Neolithic
Presentation Preference: Oral

The landscape around Cirencester has been a major focus for archaeologists and historians for more than a century. Intensive survey activities all around the Roman town of Corinium Dobunnorum (Cirencester) have extended understandings of the Roman landscape in the area. Nevertheless, there are gaps in the picture that need explanation, and much to be done in relation to the earlier prehistoric landscapes. As a case study the whole area of Abbey Home Farm on the east side of Cirencester was chosen to try to explore whether the gaps have a "historic reality" or are to be seen as a consequence of survey patterns. The land is managed as an organically farm with concerns for the conservation and management of both the natural and historic environments to the fore. Intensive field-walking over the last 50 years, aerial photography, and large scale magnetometry uncover a previously unknown intensity of land-use during the millennia. This contribution focuses on the Neolithic landscape and its associated monuments.

04 GEOPHYSICAL SURVEY CHALLENGES AT THE PYRAMIDS OF MEROE (SUDAN)

Author: Ullrich, Burkart - Eastern Atlas, Berlin (Presenting author)
Co-Author: Dr Abdelwahab, Mohammed - University of Dongola, Dongola; Dr Bashir, Mahmoud Suliman - National Corporation for Antiquities and Museums, Khartoum; Bushara, Murtada - National Corporation for Antiquities and Museums, Khartoum; Dombrowski, Juergen - Freelance cameraman; Dr De Neef, Wieke - University of Groningen; Pilz, Dana - Eastern Atlas, Berlin; Dipl Ing Riedel, Alexandra - German Archaeological Institute, Berlin; Dr Wolf, Pawel - German Archaeological Institute, Berlin
Keywords: Meroe, Pyramids, Archaeogeophysis
Presentation Preference: Oral

We present challenges and practical solutions of large-scale geophysical prospection at the Royal pyramids of Meroe (Sudan) near the capital of the Meroitic kingdom (3rd century BC – AD 4th century). The UNESCO world heritage site is famous for more than 100 elite burials marked with sandstone pyramids. The current cooperation of the Qatari Mission for the Pyramids of Sudan (QMPS), the National Corporation for Antiquities and Museums (NCAM) and the German Archaeological Institute (DAI) focuses on the North and South cemeteries of Begrawiya and the adjacent Wadi Tarabil, a large valley on the edge of the mountains, about 5 km east of Meroe. Efficient high resolution survey of Wadi Tarabil, stretching over 700 m in North-South and East-West direction, requires a mobile multi sensor, GPS controlled device. Main challenges for a large-scale magnetic survey are the different surface conditions, which comprise open areas, bush savannah, loose sand dunes, spoil heaps of former excavations and building material. An additional challenge is the need to avoid damage to yet unknown underground descendaries to the pyramids by motorized vehicles to pull the system. We faced these challenges using the ultra-light and flexible magnetic survey system LEA MAX (Eastern Atlas). The device can be easily transported as standard air luggage and assembled in the field in short time. Surveying the large open areas, the device was used as a mobile ten sensor system and it was modified to a six sensor carrier system for additional surveys between the pyramids and on exposed sandstone ridges. The presentation highlights the specific requirements of the project in the desert and the technical challenges to overcome. The results of the geophysical surveys are presented in relation to the subsurface information from excavations at one of the earliest pyramids, the tomb of Queen Khennuwa.

05 THE DOBUŻEK SCARP MICROREGION (E POLAND) IN THE LIGHT OF GEOPHYSICAL PROSPECTIONS AND SURFACE SURVEYS

Author: Dr Furmanek, Mirosław - Institute of Archaeology, University of Wrocław (Presenting author)
Co-Author: Dr Chmielewski, Tomasz - Institute of Archaeology and Ethnology, University of Gdańsk; Mackiewicz, Maksym - Institute of Archaeology, University of Wrocław; Myślecki, Bartosz - Institute of Archaeology, University of Wrocław; Prof Zakościelna, Anna - Institute of Archaeology, Maria Curie-Skłodowska University
Keywords: Volhynia, enclosures, landscape
Presentation Preference: Oral

The Dobużek Scarp is a regionally specific and well-defined physiographic formation within the Sokal Ridge (Volhynian Upland). The characteristic steep stepwise slope rising nearly 40 m above the Huczwa valley provides natural defensive conditions, whereas three dry valleys cutting the Scarp facilitate communication with the river. Fertile soils on the loess plateau that spreads northwards of the Scarp offer good conditions for agriculture. No less important is the localization of the Scarp by the Huczwa river, which is the second most important waterway of the so-called Volhynian Gate communicating the Baltic with the Pontic zone.
Until quite recently, the archaeological investigations in the area have been limited to occasional surveys and trial trenching. Only in 2012 a wider research project comprising surface surveys, geomagnetic prospections and small-scale excavations was formulated. The results were interesting enough for conducting extended research on this prominent element of the regional cultural landscape. Further investigations, granted by the National Science Centre, covered over one hundred square kilometers, more than 50 hectares of which were scanned with a high-resolution fluxgate gradiometer. During excavations almost 30 ares were unearthed.

In the course of the fieldwork, two systems of enclosures, each surrounded by two or three ditches were discovered. Additionally, we recorded numerous anomalies interpreted as pits, houses, fireplaces, or kurgans. The rich surface-collected artefactual substance corresponding with the magnetic signals, informs about the presence of relics dating back to the Halstatt Period, Early Bronze Age, and Eneolithic. This picture has been already confirmed by the excavations.

Certain spatio-temporal aspects of settlement on the Scarp still need to be critically reassessed, nevertheless, the data and observations gathered so far give us a firm ground to approach questions regarding the character of exploitation of the place, its position within the microregion, and its role in mesoregional settlement networks.

06 CHANGING PICTURES AT HOPEWELL CULTURE SITES IN OHIO, USA - LANDSCAPE-SCALE GEOPHYSICAL SURVEYS AT HOPEWELL MOUND GROUP, SEIP EARTHWORKS

Author: Professor Lüth, Friedrich - German Archaeological Institute, Germany (Presenting author)
Co-Author: Professor Darvill, Timothy - Bournemouth University, UK; Dr Ruby, Bret - Hopewell Culture National Historical Park, USA; Dr Burks, Jarrod - Ohio Valley Archaeology, Inc., Columbus, Ohio, USA; Dr Messal, Sebastian - German Archaeological Institute, Germany; Dr Komp, Rainer - German Archaeological Institute, Germany
Keywords: Magnetometry, Hopewell, Chillicothe
Presentation Preference: Oral

Hopewell Ceremonial Sites are amongst the most well-known North American ritual sites. Itineraries show these impressive sites as early as the 18th century. They have been in the focus of academic interest for more than a century. Many of the sites have been under agriculture, and most of the early recorded standing features have been plough-levelled. Given their enormous size in the landscape all the excavations carried out so far have only revealed a small insight into the spatial organization of such ritual places.

Following successful early pioneering geophysical surveys, large scale magnetometry has been applied at several sites within the Hopewell Culture National Historic Park near Chillicothe, USA. This paper presents the first results of a newly investigated ritual landscape.

07 REVEALING RITUAL LANDSCAPES AT THE HOPEWELL MOUND GROUP, OHIO, USA

Author: Dr. Ruby, Bret - US National Park Service (Presenting author)
Keywords: geophysics, landscapes, ritual
Presentation Preference: Oral

The Hopewell Mound Group is the type site for the "Hopewell culture," a cultural climax in the Eastern Woodlands of Native North America during the first four centuries of the Common Era. The Hopewell episode witnessed the construction of elaborate ceremonial precincts marked by monumental mounds and geometric earthwork enclosures encompassing up to 50 ha or more. Excavations at the dawn of American archaeology in the nineteenth century encountered exquisitely crafted artifacts fashioned from exotic raw materials: evidence of a religious movement that linked American Indian societies in an interaction sphere spanning half the continent. But archaeological attention in the twentieth century remained narrowly focused on mounds and mortuary contexts, ignoring the vast spaces in between. Agricultural plowing steadily eroded the above-grade features. However, recent landscape-scale geomagnetic surveys are revolutionizing our understanding of these sacred landscapes. These surveys are documenting the subsurface integrity of many plowed-down mounds and earthworks, and revealing a host of anomalies both large and small filling the spaces between the monuments. This presentation describes the results of two seasons of targeted excavations intended to ground truth several intriguing anomalies. One exposed an apparent borrow pit where close to 15 cubic meters of fine-grained sand was mined for use in constructing mound floors and caps. Another focused on the "Great Circle," a circular earthwork nearly 120 meters in diameter thought to have been entirely obliterated by plowing before 1891. Our excavations revealed a broad causewayed ditch, aligned to the summer solstice sunset, flanked on the interior by a row of deep pits that likely supported huge wooden posts – an enormous Hopewell "woodhenge." Four large earth ovens at the center suggest the Great Circle hosted periodic feasts. These investigations are revealing ritual landscapes of unexpected complexity.

375 URBAN ENCOUNTERS STRATEGIES OF DISSEMINATING COMPLEX RESEARCH RESULTS IN THE CITY SPACE

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Parby, Jakob Ingemann (Denmark) - Museum of Copenhagen
Co-Author(s): Toreld, Christina (Sweden) - Bohusläns MuseumSindbæk, Søren (Denmark) - University of Aarhus, UrbnetRunge, Mads Thagård (Denmark) - Odense City Museums
Keywords: Dissemination, urban space, networks, encounters
Presentation Preference: Round table

MERC
Medieval Europe Research Community

The session takes its cue from the organizers' ongoing cross disciplinary research and project entitled Urban Encounters. Central to the project is an endeavor to explore cities as sites and generators of human networks using new theories on networks, urbanity and materiality as well as new scientific approaches. And to investigate new ways of disseminating archeological, historical and scientific knowledge in the urban space beyond the completion of the actual excavations. In this session we invite researchers and museum practitioners to join us in a discussion about the value and possible future strategies of dissemination outside the museums' walls. As part of the session we will also present our own solution – a mobile museum of networks and urban encounters – that will travel between the different partner cities and institutions in the project during the next three years. Papers in the session should relate the following points:
a) recreating the on-site attraction of archeology in urban frameworks post excavation
b) interpreting and disseminating networks based on archeological material
c) the encounter as a model for archeological analysis and interpretative practice

Read more about the Urban Encounters-project here: http://urbnet.au.dk/research-projects/urban-encounters-mobility-migration-and-networks-in-premodern-scandinavia/

01 PROCESSING THE PAST IN URBAN DISSEMINATION PRACTICES

Author: Dr Ingemann Parby, Jakob - Museum of Copenhagen (Presenting author)
Keywords: Dissemination, urban space
Presentation Preference: Oral

Based on my experiences of developing and running a number of dissemination projects in the city space of Copenhagen and elsewhere in the world my presentation will focus on three key lessons that I believe could be a useful guide for archeologists, historians and other museum practitioners when carrying out dissemination of complex material in the city space.
My primary experiences stems from developing and running a Digital Wall connected to the metro excavations in Copenhagen from 2010-2016 and from developing similar installations in Cairo, El Paso and elsewhere in the wake of the initial project. But my presentation will also draw on other smaller and newer projects from European partners.
The first lesson is the importance of conceptual clarity and mission/vision behind any successful project. You are not alone out there and it is important to figure out the whys and hows. Why do you wanna be out there? And how do you make your project stand out from all the other practices and communications juxtapositioned and intermingled in the urban space?
The second lesson is about flexibility and modality of your concept. If you are planning and ongoing recurring activity or dissemination practice the question of adaptability, user testing, user involvement at an early stage and built-in potential for growth or change is essential. Examples from past projects are used to illustrate essential points.
The third lesson deals with the importance of the personal meeting – of being there and my reflections of what being there really means in a successful dissemination project in the city space.
The presentation hopefully can help generate the ensuing discussion relating particularly to new trajectories in the dissemination of archeology.

378 ON-SITE SESSION - VISUALISING THE PAST: EXPLORING MEANINGFUL APPROACHES IN INTERPRETING THE ARCHAEOLOGICAL RECORD

Theme: 6. Interpreting the archaeological record
Author: Kocken, Marc (Netherlands) - ICOMOS NL; MARC heritage consultants
Co-Author(s): Kienzle, Dr. Peter (Germany) - LVR-Archäologischer Park Xanten; LVR-RömerMuseum, XantenThomas, Dr. Ben (United States) - Archaeological Institute of America, BostonHodges, Sue (Australia) - ICOMOS ICIP; SHP
Keywords: Xanten, archaeology, interpretation, presentation, reconstruction
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

This one-day session examines changing views on archaeological reconstruction and site interpretation and presentation using the archaeological park in Xanten, which has been in existence for 40 years, as a case study. The session begins with four short introductory lectures, followed by a site visit to the archaeological park at Xanten and a workshop on 'Guidelines for archaeological interpretation'.

Dr Peter Kienzle (LVR-Archäologischer Park Xanten/LVR-RömerMuseum, Xanten, Germany)
will introduce the sessions. Other speakers are: Marc Kocken, (ICOMOS NL/MARC heritage consultants, Bemmel, The Netherlands), Ben Thomas (Archaeological Institute of America, Boston, USA) and Sue Hodges (ICOMOS ICIP/SHP, Melbourne, Australia).

Workshop participants will be actively involved in debating topics such as: the future of archaeological reconstruction; challenges with interpreting archaeology; physical vs digital reconstruction; the role of illustrations in interpreting archaeology; the impact of new technologies such as Virtual Reality and Augmented Reality; archaeology and social inclusion; and emerging international issues in reconstruction. The workshop will conclude with a summary before a return trip to Maastricht.

N.B. This on-site session is equally an excursion to be held on Sunday September 3rd 2017.

379 SUSTAINABLE IN SITU PRESERVATION OF THE ARCHAEOLOGICAL RECORD IN EUROPE: 25 YEARS OF MALTA.

Theme: 2. The Valletta Convention: the next 25 years
Author: Pieters, Marnix (Belgium) - Flanders Heritage Agency
Co-Author(s): De Groot, Tessa (Netherlands) - Rijksdienst Cultureel ErfgoedSchreurs, Jose (Netherlands) - Rijksdienst Cultureel ErfgoedAnnaert, Rica (Belgium) - Flanders Heritage Agency
Keywords: selection, preservation, sustainable management, stakeholders
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

A widely used legal instrument for a sustainable management of the archaeological record is the scheduling of archaeological sites as 'in situ protected' archaeological areas. This designation of the most valuable archaeological sites is ideally based on a thorough inventory allowing a synthetic overview and an evaluation of the presence, the status of preservation and the research potential of archaeological sites to be protected. However, together with the selection procedure based on archaeological considerations also other parameters have been taken into account. In some cases a protection 'ex situ' was more preferable than a preservation 'in situ' due to current land use practices or ongoing erosion e.g.. Another possible parameter is the burden, financial or other, that the protection of archaeological sites can bring along for the public or private landowner and for the society in general. With this in mind raising and maintaining public awareness and support relies often on making compromises and realizing a delicate balance between the different stakeholders involved in the process of protection. Finally, the protection of archaeological sites relies on programs of well-thought management schemes, which in the first place have to be realistic to allow successful implementation, and secondly should ideally be in line with other interests and land uses. This session aims to bring together best practices from all over Europa concerning the following topics: the process of archaeological selection in the light of protection of archaeological sites; and harmonizing the archaeological management of these sites with the interests of the stakeholders.

01 THE LONG AND WINDING ROAD OF PROTECTING ARCHAEOLOGICAL SITES IN FLANDERS (BELGIUM).

Author: Mrs. Cousserier, Katrien - Flemish Heritage Institute (Presenting author)
Co-Author: Mr Meylemans, Erwin - Flemish Heritage Institute; Mrs. Annaert, Rica - Flemish Heritage Institute
Keywords: in situ preservation
Presentation Preference: Oral

Only since the archaeological legislation of 1993 the protection of archaeological sites was possible through a specific set of legal instruments. However, a number of archaeological sites were already scheduled through The Monuments Law from 1931 (foremost designed for the management of built heritage and historical landscapes), for the most part visible sites such as mottes and tumuli. Besides this a large number of built heritage items (churches, castles, ...) were scheduled through this legislation, however often with no or only piecemeal consideration of the present archaeological values. This approach has important consequences for the current archaeological management of these sites.
In any case, the archaeological legislation of 1993 meant an important shift in attitude from a more 'individual' to a 'communal' sense of heritage management approach.
Despite the possibility to protect archaeological values since the archaeology decree from 1993, the first real protection as an archaeological site dates only from 2005. Through the current new legislation (2013), the possibility to protect archaeological sites is further consolidated. Up till now,35 archaeological sites have been protected.
Even though an in-situ protection seems the obvious answer for protected archaeological sites, this is often problematic in Flanders, because of the high pressure on land use. The public interest of such sites seems to be an equally problematic issue. For example, the financial compensation the law provides for private land owners for adequate management of archaeological sites is little to none.

02 DIFFERENT TIMES, NEW CHALLENGES. MANAGEMENT AND PROTECTION OF ARCHAEOLOGICAL MONUMENTS IN THE NETHERLANDS.

Author: Drs. Groot, Tessa - Cultural Heritage Agency of the Netherlands (Presenting author)
Co-Author: Drs. Schreurs, José - Cultural Heritage Agency of the Netherlands
Keywords: Selection, management, protection
Presentation Preference: Oral

The Netherlands have 1435 scheduled archaeological monuments. This selection of monuments is diverse in terms of categories and the periods from which they descend: ranging from settlements dating in the early Stone Age to dikes from the modern period. The element of visibility always played a major role in valuing and selecting sites, resulting in a high number of scheduled prehistoric burial mounds and settlement mounds.
Valuing and selecting archaeological sites for legal protection has traditionally been a task carried out by experts of Cultural Heritage Agency. However, the increasing involvement of other parties in the management of the archaeological heritage and the strong interest for and appreciation of archeology by the general public make clear that reflection and thinking about new ways of managing and protection is necessary.
In this paper we will present a short history of the development of the Dutch selection of listed monuments, the current situation of and challenges for in situ protection and finally some best practices and ideas for a new way of selecting and managing of archaeological sites.

03 THE LOWER GERMAN LIMES: UNDERSTANDING AND MANAGING A MILITARY LANDSCAPE

Author: Prof. Dr. Lüth, Friedrich - German Archeological Institut
Co-Author: M.A. Bödecker, Steve - LVR-Amt für Bodendenkmalpflege im Rheinland (Presenting author)
Keywords: UNESCO, limes, landscape
Presentation Preference: Oral

The Lower German limes formed one of Rom's most important frontiers. In the first century AD, the highest concentration of legionary troops in the north-western part of the Roman Empire was ordered to the banks of the River Rhine. The impact of the roman army on the landscape in this area is still less understood. In preparation of the Dutch-German UNESCO world heritage application of the Lower German Limes, an extensive high-resolution geophysical survey was undertaken on four key sites in the Xanten region leading to a new scale of view on roman military land use. Beyond the perimeter of permanent forts and fortresses and their civilian settlements, growing evidence for further temporary military actions and installations can be detected. This leads on the one hand to a broader view on the complexity of a landscape used and formed by the Roman army and on

the other hand to the need of much larger areas of scheduled monuments as before. This will also cause major implications on actual heritage management and community involvement. Four key sites and actual management principles will be presented.

04 THE ROYAL PLACE WERLA - BETWEEN ARCHAEOLOGICAL RESEARCH, NATURE CONSERVATION AND TOURISM

Author: Dr. Blaich, Markus C. - Niedersächsisches Landesamt für Denkmalpflege (Presenting author)
Keywords: Heritage management, environment
Presentation Preference: Oral

The interdisciplinary research of the medieval Königspfalz Werla (10/11th. century) near Braunschweig is among the most ambitious projects of the Lower Saxony State Heritage Managmenet Service. The aim is not only the research of a royal place with pre-urban structures, but also its presentation to the public and in-situ conservation. A particular challenge is the total area of more than 20 ha, within the midst of a farming environment.
After the purchase of the area by the State of Lower Saxony, a multi-stage, modular concept for scientific and touristic presentation was developed. Following this concept, ground plans and stone foundations will be visualized by restrained manning and careful supplementation. Other areas are presented with means of landscape and nature conservation, with the aim of recreating elements of the medieval cultural landscape.
The aim of this project is to open up an archaeological landmark with means of the administrative framework for the protection of environment and nature and to present it as a freely accessible public landscape park

05 AGAINST RETENTION IN SITU

Author: Professor Dr Karl, Raimund - School of History, Welsh History and Archaeology (Presenting author)
Keywords: law, preservation, research
Presentation Preference: Oral

Retention in situ of archaeological remains has become one of the ideological cornerstones of archaeological heritage management in much of Europe, particularly so in Austria and Germany. The highly restrictive legal regimes of the 16 German and the Austrian heritage protection laws aim at prohibiting any archaeological excavations wherever possible. Legal commentaries even go as far as referring to proper research excavations as 'vanity excavations'. These, it is argued, must be prevented because they destroy archaeology which would be preserved if it were simply left in situ. Some commentaries go even further and claim that the state has a research privilege, while any 'private' (non-state) research is inherently damaging and socially unacceptable.
Preservation requires active measures to monitor and counteract potential loss of archaeological substance, whether this substance is finds, or features, or both. Yet, of the c. 50,000 archaeological sites known, and the c. 1,000 sites scheduled in Austria, hardly a few handfuls are monitored, and even fewer actively managed; and the situation in Germany is hardly any better. What is presented as 'preservation in situ' on paper, is mere retention in practice. It does not protect the archaeological heritage from anything other than being researched, while it is lost unnoticed and unrecorded to degradation and erosion.
In this paper, I will present future projections, based on past empirical data, on the general rate of attrition, and the rate of preservation by record, of the archaeological heritage. These projections demonstrate that by just retaining, rather than preserving, archaeology in situ, much more of the archaeology is lost than if there were no restrictions on archaeological fieldwork whatsoever. They also show that if we would excavate as much as we could, as soon as possible, much more of the archaeology currently still retained in situ would be preserved.

380 THE ARCHAEOLOGY OF EUROPEAN COLONIALISM: TOWARDS A POLITICALLY SITUATED RESEARCH AGENDA

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Marin-Aguilera, Beatriz (United Kingdom) - University of Cambridge
Co-Author(s): Mantilla, Caterina (Germany) - University of CologneHerrera Malatesta, Eduardo (Netherlands) - University of Leiden
Keywords: Politics, European colonialism, archaeological practice
Presentation Preference: Session with a key note speaker with contributions from discussants and discussion
Speaker: Dr Jaime R. Pagán-Jiménez

Few human communities have remained uncontacted by outsiders both in the past and in the present. Yet, only modern European colonialism affected the whole world. It is difficult to disentangle the relationship between Europe and the archaeology of colonialism, for they are historically bonded. The latter has been widely explored by archaeologists; however, the colonial implications of our archaeological practice have only started to be examined recently. The interpretation of the colonial past and the neo-colonial present has been heavily contested by powerful social groups and indigenous communities in many occasions, and archaeologists have not always had an easy way out. Unveiling and questioning our own geopolitical position and worldviews when doing archaeology is fundamental if we want to decolonise our knowledge and practice. On the one hand, there are many European teams working on different archaeological projects in their former colonies – what are the social and political implications of that? How do we engage as outsiders with local communities that are completely alien to our own experience? On the other hand, the way we construct our knowledge is deeply rooted in our own (Western) experience, i.e. how we define concepts such as 'identity', 'landscape', or 'culture' may differ from how local communities actually understand them. How do we integrate local knowledges into our 'scientific' discourse? We warmly invite researchers from different geographies and backgrounds to submit papers that deal with these questions and the intersections between archaeological practice and politics in colonial or neo-colonial contexts.

01 FROM POSTCOLONIAL DISCOURSES TO DECOLONIAL ATTITUDES: THOUGHTS ON ARCHAEOLOGIES OF ACTION AND LIBERATION

Author: Dr. Pagán-Jiménez, Jaime - Faculteit der Archeologie, Universiteit Leiden (Presenting author)
Keywords: Postcolonial, decolonial archaeology
Presentation Preference: Oral

An archaeological paradox is still in vogue. Deeply thought-out proposals, such as multivocality, co-authored construction of cultural representations, public engagement, and shared research goals between practitioners and their surrounding social worlds are now common conceptual labels in our discipline. We have given the impression that we gave up our hegemonic control of the past, matching our discourse with a kind of heterarchical praxis. Postcolonial archaeology has promoted research and other sociocultural agendas focused primarily on unraveling the colonial forces that shaped the histories of many former colonial entities. But this archaeology, and its key propositions, has failed to expose the many facets of colonialism that are still experienced worldwide. If multivocality and other proposals of postcolonial archaeology have been used to attract social actors from our surrounding work environments to our more heterarchical praxis of constructing the past, a decisive step must be taken to close the gap: this is to understand and actively participate of the decolonization processes though not only in the academic contexts, but in the world in which many of us and our collaborators still live.

02 SUBALTERN AND HEGEMONIC AMBIGUITIES: PRACTICES OF MATERIAL CULTURE, CONTRADICTIONS OF OPPRESSION, DOMINATION, AND RESISTANCE IN THE PORTUGUESE EMPIRE

Author: Dr. Cruz, M. Dores - University of Cologne (Presenting author)
Keywords: Colonialism, Portugal, Mozambique
Presentation Preference: Oral

Colonialism is more than an area of study or a conceptual tool. It is people's experiences in specific situations and places, full of contradictions and ambiguities. Writing colonial pasts has brought to the forefront the significance of a material culture approach, while raising questions of what colonized and colonizers did to each other, of complexities and contradictions of colonialism and of subaltern spaces. This paper focuses mainly on the 19th and 20th century Portuguese empire, at home and in the colonies, in an attempt to overcome a binary approach that opposes colonizers and colonized. Rather I bring metropole and colonies together to examine the colonial and subaltern roles of Portuguese populations, oppressed by a fascist political regime at home while oppressors of colonized populations. Furthermore, I discuss ambiguities in the colonial spaces by presenting the case study of Southern Mozambique, where Nuguni populations are perceived as foreign invaders, and the local "owners of the land" are the subjugated, enslaved and oppressed. Using a material culture-centered analysis, I aim to discuss the contradictions of colonialism, moving away from dichotomies of spaces and human relations to focus on ambiguous "Third Spaces" that involve multiple narratives, different perceptions of power and resistance.

03 SWEET AND SOUR ANALEPSIS. HOW BASQUES LOOK AT THEIR COLONIAL PAST

Author: Ph.D ESCRIBANO-RUIZ, SERGIO - University of the Basque Country (UPV/EHU) (Presenting author)
Co-Author: Prof. Azkarate, Agustin - University of the Basque Country (UPV/EHU); UNESCO Chair on Cultural Landscapes and Heritage
Keywords: Basques, First-Nations, Alterity
Presentation Preference: Oral

The Merrian Webster dictionary defines "analepsis" as a literary technique that involves interruption of the chronological sequence of events by interjection of events or scenes of earlier occurrence. If we speak of colonialism, archaeology and politics, then we are alluding to a multiple-temporalities-coming-together scale, out of all sort of linear chronological frames. Thus, let me refer to analepsis when trying to explain how Basques refer to their colonial past. There are two main attitudes towards colonialism in the Basque Country. One is to look away and pass the ball to the Spanish, as if colonialism hasn't anything to do with Basques, even when Basque aristocracy was totally involved in all colonial activities. The other is to focus in exclusively Basque colonial episodes, such as overseas fisheries, and tend to glorify them. In the latter case the tendency is to soften colonial activities and even to bring them out of the sphere of colonialism. In both cases the choice is politically driven. We, as archaeologists, are trying to engage the society in this subject and make people critically think on the Basque past. But there is still much to do, and we have an open front especially in relation to the colonial otherness. Archaeological relations with First Nations have developed more as political activism than as part of research programs. Once identified it as a field that urges action, a tentative proposal on how to reverse the situation is presented.

04 THE COLONIAL CREATION OF TERRITORY AND ITS LEGACY

Author: Herrera-Malatesta, Eduardo - Universiteit Leiden (Presenting author)
Keywords: Colonialism, Territory, America
Presentation Preference: Oral

This presentation aims to explore how the creation of territory in colonial contexts in the American continent and the Caribbean shaped local and regional ethnicities, histories and appropriations to the land as opposed to an "otherness" that was also created as a consequence of the colonialist process. The debate is inspired by ideas expressed by Quijano & Wallerstein (1992:550-551) a quarter of a century ago, particularly when they stated that "coloniality was essentially the creation of a set of states linked together within an interstate system of hierarchical layers. (...) But even when formal colonial status would end, coloniality would not." And therefore "ethnicity was the inevitable cultural consequence of coloniality." On the basis of two case studies, one from the Caribbean and another one from the American continent, I will explore how the creation of colonial geopolitics resulted in the transmission and replication through time of implicit ideas and definitions of ethnicity and territories. Although the two cases have early XVI and XVII century roots, the emphasis will be place on the legacy of these cases for local populations. It will be show in this presentation that certain early ethnical and territorial categories used by European colonizers after the XVI century and by the growing white local elites after the XVII century in these regions defined 1) past populations based on implicit or explicit misunderstanding of local cultures and sometimes racist categories, and 2) how this definitions have endure in time and have been integral part in the shaping of territories, communities, ethnicities and relations in the present.

05 WHO NEEDS WHOM? INTERRELATIONS IN THE CONSTRUCTION OF KNOWLEDGE IN THE POST-COLONIAL CONTEXT OF THE UNITED ARAB EMIRATES.

Author: Dr. Dunning Thierstein, Cynthia - ArchaeoConcept
Co-Author: Ms. Dunning, Ellinor - ArchaeoConcept (Presenting author)
Keywords: Expertise, interdependency, value-construction
Presentation Preference: Oral

This paper presents relations of interdependancy between international experts and local authorities in the context of the preparation of a UNESCO World Heritage nomination and management plan in Sharjah (UAE). The process of negotiation allowed us to review principles, which in our eyes seemed to correspond to our western ethical values, such as bottom-up procedures and participation, as generated by the involved international organisations. On one hand, we had to adapt our methodology. On the other, the nomination implied multiple changes in the functioning of the institutions, bringing about new ways of taking care of the cultural heritage in accordance with the traditional political structures. The fascinating fact is that the situation described above reflects the contents of the nomination, which relate to interdependancy issues between the British Empire and the Trucial States.

06 ARCHAEOLOGY AND THE POLITICS OF KNOWLEDGE. THE WHITE CUBE OF THE ACADEMIC DISCOURSE.

Author: Mg. Mantilla Oliveros, Johana Caterina - University of Cologne, Latin american History Department (Presenting author)
Keywords: discourse, Performativity, Politics
Presentation Preference: Oral

An indigenous person and a white researcher dialogued on a small canoe deep into the jungle, somewhere in the Amazonian region: "Why is that you are so attached to objects?" - Asked the native, while throwing luggage out of the canoe. The researcher tried to save some of his things, with obvious discomfort. "Those are my memories", he replied. This dialogue was fictional (from Ciro Guerra's movie Embrace of the Serpent, 2015), but it evokes well the role that Westerners give to "things" as memory containers. As archaeologists, we learn how to analyze a context, and the objects we recover from our excavations. We ask questions to produce information about the past.
What would happen if we take the native's question seriously? How are we supposed to think of that question without trying to convince our interlocutors? Based on my own experience as a Latin American archaeologist working in an Afro-Colombian community, and now studying in Germany, I have been on both sides of this encounter. On one hand, I witness local forms of knowledge constrained by generalized racism, in which the sense of being in the world is not necessarily based on "non-living objects" as memory containers. On the other hand, I am part of a deep tradition of Cartesian knowledge production, in which I am supposed to discuss the objectivity of the information I collect in the field.
In this paper, I will examine the complexity of multi-temporal experiences in Colombia. I will discuss the tensions that emerge from my double positionality (the communities I work with and my life as an academic). I will argue that it is not possible to challenge Western hegemony without questioning the political circumstances in which knowledge is produced.

07 SOCIAL PERCEPTIONS ON LOCAL COMMUNITIES AND FOREIGN RESEARCH PROJECTS

Author: Mr jean, joseph sony - Leiden University (Presenting author)
Keywords: community, perception, neocolonialism
Presentation Preference: Oral

Archaeological and ethno-archaeological data from indigenous territories and former colonies of European colonialism are important to apprehend certain part of the past. Many archaeological projects are based on collaborative approaches by engaging with Indigenous people and local communities, and the reciprocal engagement between researchers and local communities can provide a long-term success for collaboration and bring new insights for science by using knowledge of both local communities and researchers. In spite of the relevance of this alternative dimension on conventional archaeological research, a critical approach to local community's life and foreign research projects can be considered to better understand local community's social reality. This communication seeks to discuss some social perceptions of researchers on local community's reality related to development, economy and education in order to avoid neo-colonial tendencies of making comparison between Europe and former colonies.

381 VISUALISING THE PAST, PART II - EXPLORING MEANINGFUL APPROACHES IN INTERPRETING AND PRESENTING THE ARCHAEOLOGICAL RECORD

Theme: 6. Interpreting the archaeological record
Author: Thomas, Dr. Ben (United States) - Archaeological Institute of America, Boston
Co-Author(s): Kocken, Marc (Netherlands) - MARC heritage consultants; ICOMOS ICIPHodges, Sue (Australia) - ICOMOS ICIP; SHPKienzle, Dr. Peter (Germany) - LVR-Archäologischer Park Xanten; LVR-RömerMuseum, Xanten
Keywords: interpretation, public engagement, social inclusion
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Last year's session at the EAA in Vilnius was a great success; fully booked and attended by many of you. From this, the idea of a sequel arose. This year's session will explore the future of archaeological reconstructions, with a particular focus on public engagement and social inclusion.

Some questions we will address are:
- Do physical reconstructions still fulfill people's needs and expectations or do we need to take advantage of new and innovative techniques such as VR and AR? Do we use a combination of both? How will reconstructions look like in the future?
- What is the role of traditional forms of interpretation at archaeological sites?
- How we help people to understand the past, which methods are used and what works best?
- How do we involve people with physical and mental challenges, limitations and disabilities at heritage sites and in museums?
- How do we involve immigrants with 'our' heritage? What is 'our' heritage to begin with?

- What perspectives do we adopt on the past ? Whose pasts are we representing ?

To assist with our discussions on the changing nature of archaeological interpretation, we would like to hear from archaeologists, historians, heritage interpreters, conservators, museum specialists, and other people involved with interpretation and presentation of the archaeological record.

01 USING ALL THE TOOLS IN THE BOX. A MULTI-PRONGED APPROACH TO ENGAGING THE PUBLIC IN THE SOMERSET WETLANDS, ENGLAND

Author: Dr Brunning, Richard - South West Heritage Trust (Presenting author)
Keywords: tactile, digital, traditional
Presentation Preference: Oral

The Somerset Levels and Moors in south-west England contains internationally important wetland heritage within deep deposits of peat and clay that provide superb water-logged preservation. Unfortunately these sites and lanscapes are largely invisible to the general public because they are not apparent on the ground surface.
A multi-pronged approach has been developed to overcome this problem. This includes traditional techniques such as interpretation boards and leaflets as well as booklets that tell the story of landscape change in a style aimed at the general public. In addition a more hands on experience of the past is provided by reconstructions of buildings such as a Saxon longhall or the dining-room of a Roman villa or a prehistoric wooden trackway in a reed swamp. These are popular with both adults and children and provide an opportunity for volunteers to rebuild the past themselves. To reach a wider audience 3D landscape models have been created of the wetlands at four points in time (Mesolithic, Neolithic, Iron Age, Medieval) and used to make 'fly through' films of lost landscapes and the key sites within them. These are freely available on the web.

02 THE SCHOLAR – THE MESSAGE – THE VISITOR THE XANTEN EXPERIENCE

Author: Dr. Kienzle, Peter - Landschaftsverband Rheinland (Presenting author)
Keywords: Interpretation, Presentation, Xanten
Presentation Preference: Oral

Forty years ago the Archaeological Park at Xanten opened its gates to the public. Ever since archaeologists, architects, conservators and teaching specialists tried to find the best way to communicate with the wider audience.

Archaeological remains, obvious to the excavator and the scholar, are difficult to read for more or less interested visitors. This problem increases at multilayered sites and complex find situations. Frequently, robbed out foundation trenches and minimal colour differences in the subsoil do mean a lot to the scholar and very little to the visitor. Any in depth discussion of the archaeological site results in a wide range of possible interpretations which cannot easily be transformed into a simple solution to be presented to an external person.

At the Archaeological Park at Xanten a wide variety of different solutions on how to communicate with the visitor have been employed in the last forty years. Some were more successful, others were less successful. The paper will present the Xanten experience within a framework of theoretical considerations.

03 SPATIAL RECONSTRUCTION OF THE "WORKSHOP" FEATURE FROM BÁNOVCE NAD BEBRAVOU (WESTERN SLOVAKIA)

Author: Mgr. Chmelo, Ladislav - Constantine the Philosopher University Nitra
Co-Author: Mgr. Styk, Matej - Constantine the Philosopher University Nitra (Presenting author)
Keywords: Early_Iron_Age, spinning_and_weaving, 3D_spatial_analyses
Presentation Preference: Oral

The Early Iron Age site in Bánovce nad Bebravou, Biskupice – Keblov II (western Slovakia) was excavated by Archaeological Agency in 2014. During the excavation there was found a feature connected with spinning and weaving – one of the important activities of Early Iron Age people, which penetrated to various spheres of life. This paper concerns short multidisciplinary evaluation of the site with spatial analyses and reconstruction of the so called „workshop" feature and its respective activities. The spatial analysis is evaluated by applying virtual space. The procedure is based on 3D reconstruction of individual features and creating of possible solutions in relation to original record. Part of this procedure was based on abstract visualization from archeological record and second part used data from 3D photogrammetry. Results includes among visualization and space distribution of individual features, possible interior proportion and hut structure which could be used in this case.

04 BONES, PHOTOGRAMMETRY AND VIRTUAL RECONSTRUCTION: BRINGING PREHISTORIC VIOLENCE TO THE PUBLIC

Author: Ordoño, Javier - University of the Basque Country; ARKIKUS: a Window to the Past (www.arkikus.com) (Presenting author)
Co-Author: Fernández-Crespo, Teresa - University of the Basque Country; University of Oxford
Keywords: VReconstruction, photogrammetry, bones
Presentation Preference: Oral

Virtual Archaeology has changed the way to approach the interpretation and presentation of the archaeological record. While usually applied to large open-air sites and/or built heritage, digital techniques for virtual reconstruction are increasingly being used to document, analyse and display artefacts, even the tiniest ones. This allows to visualise objects that would be hardly displayed at museums because they are under study, they pose conservation issues or they are simply not included in the display collection.

Resulting 3D models can be integrated into an increasing variety of outputs adapted to a wide range of audiences, including children (e.g. didactic mobile apps), persons with reduced mobility (interactive contents available online, like Sketchfab) and blind or partially sighted people (printed 3D replicas), improving informative and engaging capabilities.

Here, as a case study, we present our experience with the virtual reconstruction of prehistoric bones, namely those showing clear signs of interpersonal violence from the Late Neolithic period in north-central Spain. We will explore how the application of photogrammetry and 3D modeling has rendered new possibilities both to analyse and to broadcast this singular skeletal evidence.

05 ASSESSING THE IMPACT: AN EVALUATION FRAMEWORK FOR 3D VISUALISATIONS OF ARCHAEOLOGICAL SITES. THE ERIMI- LAONIN TOU PORAKOU EXPERIENCE

Author: Dolcetti, Francesca - university of york (Presenting author)
Keywords: 3D, evaluation, engagement
Presentation Preference: Oral

3D digital models have become widely adopted not only for research purposes but also for museum exhibitions. However, they are often uncritically adopted without a clear idea of how they might be used and perceived by different audiences.
The application of 3D interactive models in archaeology in both academic and public dissemination domains needs to be properly evaluated, to understand how it affects people's engagement and perception of past cultures.

In order to address this issue, I present a research project focused on evaluating the impact that 3D modelling has upon archaeological research, as well as academic and public dissemination. The aim is to evaluate how a specific form of digital visualisation is perceived by varying audiences and stakeholders (specifically experts, students, local communities), assessing its efficacy using different locations and methods of performance (including web presentation, exhibition).

Using the case study of the Middle Bronze Age Cypriot settlement at Erimi- Laonin tou Porakou (2000-1450 BC), the research considers each phase of the multistage process from the creation of an interactive 3D model, to its presentation to varying audiences in a range of settings, to the evaluation of its effectiveness and the definition of guidelines for a subsequent improvement using users' feedback.

The methodology proposed for this projects entails the application of both qualitative (interviews and focus groups) and quantitative (questionnaires) approaches and an evaluation framework involving multiple iterations. Through a study conducted using different user groups (composed of expert and non-expert users), I collected and analysed users' feedback, in order to identify the best way to present the 3D models of archaeological sites to different audiences, improving their impact and comprehensibility.

383 WRINKLES IN TIME? EXPLORING COMMUNITY THROUGH TEMPORALITIES OF THE PAST

Theme: 6. Interpreting the archaeological record
Author: Miller Bonney, Emily (United States) - CSU Fullerton
Co-Author(s): Johnson, James (Denmark) - University of Copenhagen
Keywords: community, temporality, materiality
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Attempting to impose order on excavation archaeologists rely on concepts of community as particular assemblages of objects, people and animals read through varying analytical
frameworks. Under the influence particularly of Bruno Latour and Ian Hodder scholars have focused on the spatial and material markers of community. Were there shared uses of space that constituted the core of the community? Did material objects have agency in the formation of community? Does the suite of artefacts and built environment reveal information about social integration and shared identity? Responses to these questions whether framed as networks or entanglement follow the spatial turn in archaeology looking to the distribution of settlements, dwellings or other elements of material culture. But lives – including those of communities and their material constituents – unfold over and through time in often haphazard ways. Taking our ideas from Gilles Deleuze and Felix Guattari this session seeks to redress the imbalance between community space and time, by exploring the roots of community becoming. This should encourage papers that adopt diachronic approaches - community in and through time, as well as in and through space. We challenge session participants to think of community both theoretically and methodologically in more temporally- and spatially-rich ways and invite papers from across the chronological spectrum as this session focuses not on a particular time or place or phase of human development but on the diversity of evidence that can be used to explore how communities come into being both in space and over time.

385 TOWARDS DIGITAL INFRASTRUCTURES FOR OPEN, PARTICIPATORY, PUBLIC ARCHAEOLOGY

Theme: 2. The Valletta Convention: the next 25 years
Author: Fernie, Kate (United Kingdom) - 2Culture Associates
Co-Author(s): Dallas, Costis (Canada) - University of TorontoLaužikas, Rimvydas (Lithuania) - University of
VilniusDegraeve, Ann (Belgium) - Heritage Direction of the Brussels Capital Region
Keywords: Digital Archaeology, Participation, Innovation
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

On the 25th anniversary of the Valletta convention, this session aims to explore how digital infrastructures are providing new ways to make connections between those involved in the protection of the archaeological heritage, researchers, commercial archaeology and the public. The Convention on the Value of Cultural Heritage for Society (Faro 2000) sets out the rights of people to access, participate, and benefit from cultural heritage and contribute towards its enrichment. Digital infrastructures such as ARIADNE, Europeana and CARARE are creating new opportunities to access aggregated digital archaeological resources from across Europe. National infrastructures such as those of the Archaeology Data Service and the Data Archiving and Network Services offer access to grey literature reports and archaeological archives. Other initiatives are exploiting digital technology to involve members of the public in reporting finds, in digitization projects and crowd sourcing campaigns to photograph protected monuments. This session aims to explore how digital tools and services can engage the public with archaeology, and moves towards a truly participatory and open social archaeology, unlocking its value to foster citizenship, innovation, economic growth, employment and social cohesion.

We will seek papers that look at the challenges for meeting the objectives of a participatory heritage, involving diverse stakeholders including young people and children, land management, education, tourism, research and the creative industries; the promises and challenges of digital technology; and examples of innovative projects which enhance social access and participation to archaeological sites and data.

01 ARCHAEOLOGICAL RESEARCH PRACTICES, INFRASTRUCTURES AND NEEDS IN THE DIGITAL ENVIRONMENT: A EUROPEAN SURVEY

Author: Prof. Dallas, Costis - Faculty of Information, University of Toronto; Digital Curation Unit, IMIS - Athena Research Centre
Co-Author: Ms Chatzidiakou, Nephelie - Digital Curation Unit, IMIS - Athena Research Centre; Dr Benardou, Agiatis - Digital Curation Unit, IMIS - Athena Research Centre (Presenting author)
Keywords: infrastructures, information_practices, survey
Presentation Preference: Oral

This paper presents an analysis of the scholarly practices and needs of archaeologists across Europe in the digital environment, focusing in particular on aspects related to the use of digital infrastructures, services and tools, as well as attitudes towards openness and collaboration in archaeological work. Our inquiry draws from the results of a trans-European survey conducted in 2015 by the Digital Methods and Practices Observatory Working Group of DARIAH, the Digital Research Infrastructure in the Arts and Humanities, on the scholarly practices and digital needs of humanities, which elicited more than 2300 responses by humanists from more than a dozen European countries, of which 207 identified themselves as archaeologists. Particular questions we address is the relative use of different kinds of (digital and analogue) primary sources and secondary information resources by archaeologists; the use of personal vs. standard authority lists and thesauri; the use of different infrastructures for dissemination of scholarly work, including institutional portals or repositories, research blogs or websites, commercial scholarly community platforms, generic social network platforms, online content services, and open content platforms; the use of personal and institutional research databases, and the contents of such databases; the frequency of using digital archives, data repositories, online library catalogues, social network sites, and other online services for archaeological work; the use of different kinds of software applications for research; attitudes towards open access, collaboration and sharing of archaeological resources; and assessment of particular digital needs to support aspects of archaeological work. We examine the effect of different factors, such as country of residence, age, status and seniority, and years of digital experience of respondents on reported practices and needs, and discuss the importance of conducting further qualitative investigation on scholarly information practice to ensure better fit of archaeological infrastructures with the needs of the archaeological community.

02 CONNECTING RESEARCH AND PEOPLE. DEVELOPING AN INTERACTIVE PLATFORM FOR RESEARCH FRAMEWORKS IN ENGLAND

Author: Archaeologist Miles, Daniel - HE - Historic England (Presenting author)
Keywords: research frameworks community
Presentation Preference: Oral

Historic England is funding a new approach to improve the coordination of archaeological research in England by developing a new online collaborative suite of revised Research Frameworks. Research Frameworks are an important way to coordinate research effort which supports the effective management of the historic environment, including the planning system. They have been produced by the professional sector for use by this same sector. However, now there is a move away from the traditional paper based monographic approach of static research frameworks to a more dynamic updatable and "live" online model. With this comes the opportunity of broadening out the scope of these frameworks so that they become much more collaborative and inclusive, engaging with a broad range of stakeholder groups.
A recent report "Assessing the Value of Community Generated Research" (2016) highlighted the potential value of community research to enhance Research Frameworks. Its recommendation to promote community researchers as active intellectual contributors rather than just passive conference attendees has been taken on board. The online platform will provide multiple spaces for research frameworks to be hosted enabling them to be joined together and cross searchable. At its heart is the wiki approach enabling research communities – including community groups and independent researchers to participate, add and edit content and take responsibility for updating period syntheses, revise or suggest new research agendas and contribute to developing the next generation of research frameworks.
This presentation will introduce this model of online collaborative Research Frameworks. It will examine some of the issues surrounding it, including a significant culture change and the benefit it offers as an approach to open, participatory public archaeology.

03 SEEING THE LIGHT OF DAY: UNLOCKING THE COMMUNITY AND RESEARCH POTENTIAL OF ARCHAEOLOGICAL ARCHIVES

Author: Ms Fernie, Kate - 2Culture Associates (Presenting author)
Keywords: Archives, Research, Community
Presentation Preference: Oral

In the last 25 years the Valletta Convention has influenced national policies and guided the preservation of the archaeological heritage. In England, measures for conserving and enhancing the historic environment are incorporated in the 2012 National Planning Policy Framework; archaeology has been considered in planning policy since the introduction of PPG 16 in 1990.

As a result, archaeologists have been busy excavating to record archaeological evidence before sites are destroyed. Large volumes of archives have been produced and deposited with museums or are held by contracting archaeology units. The volume of material has created issues for museums. Storage facilities are under pressure, stores are full and there is a lack of resources and shortages of specialist staff. Securing the archives which result from development lead archaeology for future research and public access is not yet fully addressed.

The aim of the "Seeing the Light of Day" project is to develop sustainable solutions to the management, long-term preservation and accessibility of archaeological archives in the South West of England. Unlocking the community and research potential of these archives is an important part of the brief. The project is working with museum curators, contractors and planning archaeologists to explore ways of enhancing the visibility and value of archaeological archives.

ICT and digitization provide both opportunities to involve members of the community in cataloguing archives, in community research projects and providing platforms for dissemination and access. There are opportunities to create connections between grey literature reports and digital materials and the physical components of the archive deposited with museums. But there are also challenges to be faced to secure time and funding, and to change thinking about archaeological archives from being dusty boxes that are the end product of fieldwork, to a valuable resource for research and the public.

04 BEYOND THE SHARING IN ARCHAEOLOGY

Author: Laužikas, Rimvydas - Vilnius University Faculty of Communication (Presenting author)
Keywords: sharing, participatoring, crowdsourcing
Presentation Preference: Oral

Researchers, when discussing the impact of digital ICT in the sphere of cultural heritage and memory institutions, usually emphasize their technological value, paying less attention to the social aspects of the ICT impact. But, the investigations of another sectors enable us to discuss the new concepts of heritage and the changes of the heritage functioning in society in overall context of digital culture. One from these concepts (followed by new functions) is the concept of "sharing heritage", based on the more general concept of "sharing economy" as socio-economic ecosystem built around the sharing of human, physical and intellectual resources, which includes the shared creation, production, distribution, trade and consumption of goods and services by different people and organisations and create additional value through sharing. Application of "sharing" concept in archaeology means the building of archaeological socio-economic ecosystem around the sharing of heritage information in broader sense (raw data, structured information, knowledge and experience, interpretations and etc.) and creation of additional values more not through ownership, but through sharing and more not by experts, but by "crowds" using the participatory ways.
In this context, the archaeology is contemporarilized, it functions not so much as knowledge of the past, but more like the element of present culture. Thus the line is being erased between the archaeology (which belongs to the past and represents past culture) and contemporary culture. The archaeology essentially becomes a present – like a tool of modern culture, modern entertainment industry, identity construction, political communication, etc., acting not so much as a place (cf. genius loci, lieux de mémoire), but more like the idea of people communities (cf. CIDOC -CRM, E28 Conceptual Object) which were displaced with the help of different kinds of digital infrastructures.

05 CITIZAN'S DIGITAL TOOLKIT: ALLOWING CITIZEN SCIENTISTS TO MONITOR ENGLAND'S AT-RISK COASTAL HERITAGE

Author: Ostrich, Stephanie - CITiZAN (Coastal and Intertidal Zone Archaeological Network); MOLA (Museum of London Archaeology) (Presenting author)
Keywords: community, app, 3D-photogrammetry
Presentation Preference: Oral

England's coastal and intertidal archaeology is increasingly at risk from winds, waves, rising sea levels and ferocious winter storms and can be revealed suddenly and disappear just as suddenly. However there is no statutorily informed intervention for this 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 set up in direct response to these threats which raises awareness of at-risk archaeology across England. CITiZAN runs training sessions, teaching local volunteers to identify, survey and monitor the long-term fate of their local coastal sites. This paper will discuss the digital methods on which CITiZAN rely to not only engage with but also to mobilise wider audiences, including 3D photogrammetry of intertidal sites, an open-access interactive website and free smart phone app. These tools allow those who cannot physically access the demanding environment of the foreshore to still interact with, interrogate and interpret intertidal heritage. The smart phone app is a rapid recording tool which allows not only trained CITiZAN volunteers but also any coastal user with a keen eye and a smart phone to record fragile coastal and intertidal heritage and monitor changes brought about by erosion and storm damage. CITiZAN volunteers are empowered to be not just data collectors but true citizen scientists, and are encouraged to discuss their findings and provide preliminary analysis on our blog and at our annual national conference. This digital toolkit enables the public to 'take responsibility' for the archaeology in their local areas, giving them a sense of pride and ownership over their heritage while they make real contributions to the archaeological field.

06 RE-DISCOVERING ARCHAEOLOGICAL HERITAGE USING MOBILE TECHNOLOGIES. THE CASE OF NON-ACCESSIBLE MONUMENTS OF ANCIENT THESSALONIKI

Author: PhD Candidate Theodoroudi, Eleftheria - AUTH (Presenting author)
Co-Author: Prof Kotsakis, Kostas - AUTH; Ass. Prof. Kasvikis, Kostas - UoWM
Keywords: digital applications, publicarchaeology
Presentation Preference: Oral

The purpose of this paper is to present the action "Invisible monuments, digital memory", a combination of digital social media and mobile phone technology, aiming at raising public awareness on antiquities hidden under the modern urban development in the center of Thessaloniki. The action was implemented last September in the framework of the European network NEARCH http://www.nearch.eu/ and explores the use of social networks and digital applications in re-connecting people with archaeological heritage. The selected seven sites presented at the event have been excavated earlier in the 20th century and kept in Thessaloniki's city center, largely lost from public memory due to their state of preservation.
The information provided through digital media was designed to transfer some idea of the context in which archaeological research is carried out and management decisions are taken. The actual event was implemented using mobile phones or tablets and QR codes placed near the monuments within the urban fabric of the city. In addition, participants were given the option to fill in an online questionnaire, related to their perception of heritage and their experience of the event. We will present both the action and the results of the survey. We will also examine whether this action, or similar actions, and the encouraged discussion in social media, have the potential to re-introduce invisible or largely forgotten monuments, and therefore add an element of a long diachrony to the daily life of people leaving in the urban context of the city.

07 TEACHING ABOUT ARCHAEOLOGICAL FINDS VIA WEB-BASED QUIZ AND IDENTIFICATION APPLICATION

Author: Mr Kimber, Andres - University of Tartu (Presenting author)
Co-Author: Mr Sikk, Kaarel - University of Luxembourg
Keywords: digital learning, heritage
Presentation Preference: Oral

Gaining even a basic understanding of diverse archaeological finds often requires strenuous work with textbooks and various scientific publications and also first hand experience, for example, in museums or during fieldwork. Although archaeology students tackle this task during undergraduate studies, many are discouraged by the monotonous

process. Furthermore, the aforementioned resources are often not readily available for the general public. This includes, among others, metal detectorists, historical re-enactors and other enthusiasts.
In order to make learning about archaeological finds more attractive, interactive and accessable, we are developing a web-based application, which in addition to a simple find identification catalogue includes quizzes. These consist of different games, where users have the opportunity to identify the age, type and elements of finds based on pictures and drawings. Gamification of the learning process will inspire users to be more enthusiastically invested, as aspects of challenge and rewards amplify the experience.
Initially the source material for the application if composed of Estonian Iron Age and Medieval archaeological finds. The database can be continuously updated to include more and more material. This will produce a comprehensive learning tool suited even for users with more advanced archaeological knowledge.
We plan on utilising the application in bachelor's and master's level courses and in license training for metal detectorists. Being available for everyone to use, we will be promoting the application among history teachers, cultural heritage management personnel and in history museums. As the application can be used on mobile devices, it enables users to interact with finds in the field more purposefully.
As a result of developing the application, we believe that heritage, in the form archaeological finds, will be made more accessible and meaningful for everyone.

386 ARCHAEOLOGICAL HERITAGE POLICIES AND GOOD PRACTICES OUTSIDE EUROPE

Theme: 2. The Valletta Convention: the next 25 years
Author: Robrahn Gonzalez, Erika (Brazil) - UISPP - Union International des Sciences Pre et Proto Historiques
Co-Author(s): Lueth, Friedrich (Germany) - German Archaeological InstituteRay, Ranjana (India) - Calcutta University
Keywords: Archaeological Heritage Policies, Good Practices
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

This session's goal is to analyze different models, practices, and solutions referring to Archeological and Cultural Heritage management, developed in non European infrastructure - projects of medium to large scale.
In many African, Asian and American countries infrastructure-investment projects affect large areas: irrigation plans, power plants, linear projects that cross hundreds or thousands of kilometer such as transmission lines or railways are forming real transects in regions of little or almost unknown archaeological potential.
The decision making process involves participation of many parties reaching from scientific and legal archaeological praxis, but also the involvement of the local public. This includes gathering of data that will (whenever possible) preserve the heritage and promote the valorization of local culture and history.
This session has its focus on the communications of projects and researches developed in non European countries. These may be presented both by professionals from these countries, as well as European that participate within research projects through partnerships and cooperation.
Models, good practices reports, and solutions shall help to develop heritage management through better understanding among specialists respecting the local, regional, national and global diversities and individualities.
We finally encourage the participants to present a reflection about research directives and good practices considering the Valleta Convention, promoting comparisons to Heritage Practices within Europe.

01 HERITAGE AND CULTURE IN INDIA: AN ARCHAEO-ANTHROPOLOGICAL PERSPECTIVE

Author: Professor Ray, Ranjana - Calcutta University (Presenting author)
Keywords: Culture, heritage, policies
Presentation Preference: Oral

Heritage is made up of both tangible and intangible elements of culture. Culture in India goes back to 2myrs. Culture developed in a chequered pattern in India. Highly civilized urban cultures grew in the plains of Rivers Indus and Ganga. Folk cultures prevailed simultaneously in its forests, plateau, valleys, mountains and hills. Concept of heritage and its preservation came into focus with UNESCO convention, signed on 16 November 1945, which came into force on 4 November 1946 after ratification by twenty countries. India is one of them. Farther India ratified Conventions on protection of Heritage – Cultural and Natural (in 1977), safeguarding intangible cultural heritage (in 2005), protection and promotion of cultural diversity (in 2006). However, in reality the need is to create awareness among people to protect the rich heritage of this country. Due to globalization both tangible and intangible elements of culture are drastically changing, some are even becoming extinct. Tradition is preserved by the community and society concerned. In India any programme on development should be undertaken with a view to culture and heritage of the region.

02 ROLE OF PUBLIC ARCHAEOLOGY IN MANAGEMENT OF PREHISTORIC CULTURAL HERITAGE IN INDIA

Author: Mr. MONDAL, DEBASIS - CALCUTTA UNIVERSITY; ASIATIC SOCIETY (Presenting author)
Keywords: Heritage, Public archeology
Presentation Preference: Oral

Cultural Heritage Management is a global issue of the Twenty-first Century. It plays an important role in protection of archaeological materials and sites. There are number of legislations for protection of the archaeological sites as well as artefacts in India. But in most of the cases these legislations have been applied in historical sites and monuments. Prehistoric men constantly lived in different parts of India and left there traces in stratigraphical deposition belongs different geological period. Minimum effort has been taken to protect the prehistoric sites and have been destroyed day by day. Present study is an approach to explore the problems and prospect of Cultural Heritage Management in protection of prehistoric sites and find out the alternative way and role of public archaeology in the protection of those prehistoric sites.

03 HUMAN AND HERITAGE INTERACTION: THE PROTECTION OF PREHISTORIC SITES IN WEST BENGAL, INDIA

Author: Dr Tarafdar, Pinak - University of North Bengal (Presenting author)
Keywords: Prehistoric sites Protection
Presentation Preference: Oral

The evolutionary mechanism of culture stands for simple to complex, homogeneity to heterogeneity and uncertainty to certainty, a process undoubtedly evident for making culture as a unique phenomenon. It eventually became part and parcel of human life for establishing their supremacy among rest of the living creatures. As a well known

postulate culture transmits generation wise through various learning processes and proper exercise of such acts are most conspicuous for conserving the significant inevitable traits. Cultural heritage signifies the preservation of these traits for the benefit of future generations. Cultural heritage includes tangible culture (such as building, monuments, landscapes, books, ward of arts and artifacts) intangible culture (such as folklore, traditions, language and knowledge), and natural heritage (including culturally significant landscape and biodiversity).
India has unique combination of such heritages and significant prehistoric sites are more valuable in this regard. I have done a number of field works in the prehistoric sites of West Bengal a state of India, and eventually unearthed numerous stone tools and artifacts; most of them were of surface collection. But unfortunately any of the sites has not been protected or demarcated either by any of the organizations or by the government. Some of the sites are already destroyed by the peasants for agricultural work, or by the expansion of habitations and moreover by the government projects like school or helipad. I have an intention to figure out the proper mechanism for necessary preservations of these valuable sites and also to disseminate the knowledge among the local inhabitance to protect the relics of tangible cultural heritage.

04 FROM CORPORATE SOCIAL RESPONSIBILITY TO CULTURAL SUSTAINABILITY - MOVING TOWARDS THE FUTURE

Author: Ms. Basu, Asmita - Army Institute of Management; National Institute of Technology (Presenting author)
Keywords: Culture, Heritage, Corporates
Presentation Preference: Oral

Corporate Social Responsibility(CSR) denotes the system through which companies manage their activities to create an overall positive impact on society through economic, environmental and social actions. Traditionally, CSR refers to businesses' responsibility to act ethically and consider their impacts on the community as a whole. CSR recognises the importance of environment, community and society in which a business operates and thus the issues related to maintenance and development should be focused. At present, in India, companies are funding different projects vital for social development in order to meet the CSR norms. It is very important in such a situation to highlight the areas which need special attention and are often overlooked. West Bengal has a deep rooted culture and rich heritage. It is a home to a number of tribal communities and folk cultures. With urbanization and development of technologies we need to sustain our culture, heritage and societal values particularly at a time when these parameters are changing rapidly. For example the Tribal Cultural Society, set up by Tata Steel in the 1990s, is committed to the cause of preservation and promotion of tribal culture. Tata Steel as part of their CSR activity is taking various initiatives for preserving the tribal cultural heritage.
The present paper aims to highlight some of the initiatives taken up by the Corporates towards development of a community and culture and the areas which are potentially rich in culture and heritage and seeks more attention in order to obtain cultural sustainability specifically in West Bengal and how management education can be an important source of new ideas about shifting toward an integrated rather than fractured framework for sustainability.

05 TEMPLES OF BENGAL & ARCHAEOLOGICAL HERITAGE POLICIES- THE PAST, PRESENT & FUTURE

Author: Prof. Basu, Durga - Calcutta University (Presenting author)
Keywords: Temples, Bengal, policies
Presentation Preference: Oral

Extraordinarily rich, vast and diverse cultural heritage in the form of built heritage is the symbol of both cultural expression and Identity of India. A growing concern of the present generation of human beings is the preservation of their cultural heritages. Through the ages India had produced a large number of religious buildings in form of temples which have been considered as one of the most significant archaeological heritages in this country. As an integral part of eastern India, West Bengal has some unique terracotta temples of late medieval period. In the present paper an attempt has been made to probe the heritage policies for preserving and promoting region's cultural heritage.

06 MAASTRICHT CERAMICS IN JAPAN

Author: Drs Dijkman, Wim - Centre Céramique (Presenting author)
Keywords: Maastricht ceramics Japan
Presentation Preference: Oral

Considering that the first industrialist of the Netherlands, Petrus Regout, brought his goods in 1859 to Dejima for distribution in Nagasaki and beyond and that these goods were stored in the warehouse of Spengler and were found in great quantities during the excavations at Dejima
Recognizing the significance of the columns with the mark "P. Regout Maastricht" as a symbol for the worldwide distribution of Maastricht ceramics and the important role of Dejima in the relationship between Japan and the Netherlands and beyond
the former VOC-trading post Dejima and Centre Céramique confirm a long-term partnership and their determination to collaborate in any possible future endeavors.

07 "TALES OF THE JOMON AND KOFUN": ARCHAEOLOGICAL HERITAGE AND SOCIETY IN CONTEMPORARY JAPAN

Author: Dr Bausch, Ilona - University of Tokyo (Presenting author)
Keywords: public archaeology identity
Presentation Preference: Oral

In Japan, cultural heritage plays an important part in the construction and perception of Japanese identity; therefore garnering public support is considered an indispensable component of archaeological heritage management and protection policy. After outlining Japanese laws on archaeological heritage preservation, this paper will focus on the role of archaeology and heritage within current Japanese society on various levels: introducing the various stakeholders and their motivations in preserving, popularising and commercialising archaeological heritage, and exploring some manifestations of public-oriented archaeology.

One factor is the recognised importance of disseminating archaeological knowledge to the general public; moreover, archaeologists and museum curators are well aware of the necessity to cultivate an interest among children in order to ensure future patronage. Another factor is a long history of public participation in archaeological excavations. Local neighbourhood groups and volunteers play essential supporting roles in museums and archaeological-themed events.

Recently, two archaeological periods have experienced a particular surge of interest: the prehistoric Jomon period (c. 12,000-500BC), and the state-formation Kofun period (AD 3rd -6th Century). Local festivals showcasing Jomon or Kofun cultural aspects are organized by regional branches of the Ministry of Culture to encourage tourism and reinvent local

identities, particularly in rural areas. In addition to many sites with National Heritage Site status, there are currently two nominations for World Heritage listing: Northern Japanese Jomon sites including Sannai-Maruyama, and the giant royal tombs of the Mozu-Furuichi Kofun Group in Osaka, which are receiving a great deal of attention by the Japanese mass-media.

Finally, activities by non-archaeological professionals, such as writers and artists, are also promoting interest in archaeological heritage and material. In addition to museum merchandise, Jomon and Kofun-inspired themes are emerging in small-scale crafts and cottage industries.

08 THE EFFECTIVENESS OF ARCHAEOLOGICAL PREDICTIVE MAPS. MANAGEMENT AND PROTECTION OF ARCHAEOLOGICAL SITES IN ST. EUSTATIUS AND SABA, CARIBBEAN NETHERLANDS.

Author: Dr. de Waal, Maaike - Leiden University; University of the West Indies, Barbados (Presenting author)
Keywords: Valetta Caribbean maps
Presentation Preference: Oral

Archaeological predictive maps are considered valuable tools for planning officers and developers, as well as for archaeologists and the general public. The creation of such maps is an important step towards improving management and protection of archaeological heritage, education and heritage awareness.

In 2013 and 2015, archaeological predictive maps were created for the Caribbean islands of St. Eustatius and Saba (Caribbean Netherlands). Since 2010, these islands have functioned as special municipalities of the Netherlands. St. Eustatius and Saba are subject to European Dutch rules and regulations but differences do exist in how the agreements of the Malta Convention and the UNESCO 2001 Convention of Underwater Cultural Heritage are being followed.

In 2012 the Dutch Ministry of Education, Culture and Science provided the St. Eustatius Center for Archaeological Research with the task to create archaeological predictive maps for St. Eustatius and Saba. The maps were supposed to provide an impetus for implementing Malta on these islands and to come to a more effective management and protection of archaeological sites.

The maps were finished in 2013 (St. Eustatius) and 2015 (Saba). This presentation will address the question whether use of these maps has indeed contributed to an improved management and protection of archaeological sites. In addition, it will reflect on steps to be taken to ensure the preservation of archaeological heritage for future generations.

09 ARCHAEOLOGICAL HERITAGE POLICIES AND GOOD PRACTICES IN THE LATIN AMERICA AND THE CARIBBEAN

Author: Dr. Robrahn Gonzalez, Erika Marion - UISPP - Union Internationale des Sciences Prehistoriques et Protohistoriques (Presenting author)
Keywords: Latin America, Caribeean
Presentation Preference: Oral

The cultural heritage of Latin America and the Caribbean is known to be diverse, considering not only its geographical extension but also its multicultural history, dating back to at least 20.000 years. However, it is only in the 20 th century that the countries started to go through a political and social process resulting, among others, in a struggle for the recognition and preservation of cultural heritage, including archaeological remains.

In the first part of this presentation we will analyze the legislation of the Latin American and the Caribbean's countries for conducting research and preserving their sites and environmental heritage. We will focus on the policies and legislations for research in light of economic development, considering the World Bank´s recommendation to use Environmental Impact Assessment (EIA) since 1992.

Next, we will analyze how the development of good practices and solutions in infrastructure-investment projects affecting large areas effectively promote (or not) sustainable results, considering the legal, the scientific and the social needs involved. Therefore, we will be presenting case studies related to the archaeological and cultural research developed with native and traditional communities in Brazil.

We will finish the presentation by giving a critical analysis about the legislation present today in Latin America and Caribbean, in comparison with the archaeological praxis needed to understand the challenges present in our discipline today.

Finally, we will analyze the applicability of the Valleta Convention directives regarding the challenges we face, as well as presenting suggestions to widen its contribution outside of Europe.

387 STANDING STONES. THE WHOLE STORY?

Theme: 5. Comparing Archaeology Across Regions and Periods
Author:
Co-Author(s): Higginbottom, Gail (Australia) - AUSTRALIAN NATIONAL UNIVERSITYGonzalez Garcia, A. Cesar (Spain) - The Institute of Heritage Sciences (Incipit); National Research Council (CSIC)
Keywords: megaliths, palaeo-environment, genetics, digital-archaeology, comparative-assessment,
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The variety of standing stone forms and their geographical locations hint that their uses also differed widely. But is this true? How do the associations of megaliths, menhirs and miniliths differ? What material cultural elements do they share and where are they placed? What of circular and linear monuments? Apart from form, in what other ways do these differ, if at all, and what does the difference in form actually mean? Is it really about tectonics and stereotomics (Ingold 2012, 2015)? Or are these forms part of notions of circularity versus rectangularity (Bradley 2012)? What happens when they exist together? In this session, we invite papers that can help answer some of these questions through any kind of comparative assessment or those that use innovative approaches to discern differences in standing stone use or meaning, such as: the inclusion of natural megaliths, digital simulation methods that incorporate palaeo-environmental reconstructions around different site types, entire visualscapes at monuments above and below the horizon, or detailed dating and genetic work. Together, these comparative and innovative approaches should help us to begin to track which peoples were doing what, where, and how their interaction with their natural worlds and their monuments changed over time and possibly why. As well as the usual question time for individual speakers after their presentations, the session leaders will create an overview of the talk themes and results and engage with everyone in further discussion.

01 STANDING STONE ANTHROPOMORPHISM AND RITUAL CONTEXT AT THE IRON AGE CULT CENTER OF TEL DAN, ISRAEL

Author: Dr Ilan, David - Hebrew Union College (Presenting author)
Keywords: ritual, menhirs, anthropomophism
Presentation Preference: Oral

Tel Dan, in modern Israel, was a national cult center in the Iron Age, ca. 900-700 BCE. It is also noted as such in the Hebrew Bible (Judges 18:30-31; I Kings 12:29-31). Two different standing stone phenomena coexist at the site: single stones and groups of five stones. Both types are embodiments of the numinous, but they represent different aspects of the numinous. The groups of five are anthropomorphic and must be understood within the context of the movement of pilgrims through the site. Ancient Near Eastern literature and iconography can be utilized to flesh-out our understanding of these stones' meaning.

02 MONUMENT-CONSTRUCTION AS FOCUS OF COMMUNITY-BUILDING - THE CASE OF GÖBEKLI TEPE, TURKEY.

Author: MA, Current PhD student Notroff, Jens - German Archaeological Institute (Presenting author)
Co-Author: MA Dietrich, Oliver - German Archaeological Institute
Keywords: monumentality, hunter-gatherer, Neolithic
Presentation Preference: Oral

The Pre-Pottery Neolithic site of Göbekli Tepe in southeastern Turkey produced an example of megalithic monumentality so far unexpected in an early hunter-gatherer milieu. Circular enclosures formed of large T-shaped monoliths connected by walls and benches are the characteristic architecture of this site dating to the 10th millennium BC. Interpretation includes a possible function of these buildings for group gatherings, feasting, and other ritual activity. Constructing these monuments may be seen as integral part of community formation and creating social cohesion. Interestingly, in a later phase of the site, architecture at Göbekli Tepe still seems to repeat the general idea of these older enclosures, but now translates it into new shapes: the 9th millennium buildings appear rectangular, still including T-pillar arrangements, although these are reduced in size and number now.

What social implications could be assumed behind monument construction among prehistoric hunter-gatherers, and does the noticeable change in size and shape of these monuments over millennia reflect changing group structures and monument use, too?

03 NEOLITHIC MEGALITHISM IN UPPER MESOPOTAMIA

Author: Assoc.Prof. Dr. Türkcan, Ali - Anadolu Üniversitesi (Presenting author)
Co-Author: Assoc.Prof. Dr. Karul, Necmi - İstanbul Üniversitesi, Dept.of Prehistory
Keywords: Megalithism, Pillars, UpperMesopotamia
Presentation Preference: Oral

Since the discovery of stone T shaped pillars in Nevali Çori during1980's and larger phenomenon of Göbekli Tepe buildings with pillars (pfeiler), many sites in Harran Area with similar features as well as new PPNA excavated sites in Upper Tigris Region as Güsir and Hasankeyf Mounds are open to a discussion whether they were the genesis of Megalithic idea in those Pre-pottery societies in 10.mill B.C. Megalithism is a more familiar subject to the Dolmens and some probable menhirs in Thracian part of Turkey and SE Anatolia as Bronze and Iron Age monuments. So, it is an uncommon subject in Neolithic period for discussing them under the Megalithism concept in Anatolian Archaeology. New and detailed insight into the buildings of Göbekli Tepe and the ephemeral or similar "Pillar sites" especially around the same territory and landscape features (Harran Area) displayed whether they could be vertical arrangements in original on their own. So the buildings and filling process of those structures can be secondary process. Twin longer pillars in the center of these structures seems to have been the core of circular arrangements in Göbekli Tepe. Together with those new insights, some monuments and pillars actually give a hint of Megalithic features of incipient Neolithic societies which shows complex Hunter-Gatherer character with "conspicuous consumption" efforts in the dawn of Neolithic societies.
The Topic aims to discuss these monuments and pillars in their landscape as well as contextual data in the light of new research in the area.

04 MEGALITHS AND MOUNDS, WHERE THE SKY AND THE UNDERWORLD MEET? A VIEW FROM GALICIA

Author: Dr. González-García, Antonio César - Institute of Heritage Sciences, Incipit-CSIC (Presenting author)
Keywords: Megaliths, Landscape-Skyscape,
Presentation Preference: Oral

Several previous works have highlighted the relations of the megaliths with moving strategies and/or inter-visibility (see e.g. Criado-Boado & Villoch Vázquez 1996) and the search for areas where prominent topographic features are spotted or interesting astronomical alignments occur (Ruggles & Martlew 1992; Higginbottom 2015). In parallel, it seems clear now that the orientation of those megalithic chambers from a particular area seem to share a common patter in most cases possibly related to some astronomical features (Hoskin 2001).
However, is this the whole story?
In the last years we have systematically analyzed the inter-visibility of mounds at two necropolises in Galicia. The first analysis concerns the Barbanza necropolis. This includes in a small area (c. 3 Km2) 28 megalithic mounds, several of them still including extant megalithic chambers. The second area is the necropolis of Leboreiro, where in a slightly larger area we could verify the existence of over a hundred mounds. In both cases we focused especially in those cases when the foresight mounds defined the skyline, however the strategies in both areas are necessarily different but the results are complementary.
Our results indicate that the location of the megalithic monuments together with how they are built, the inner and outer structure, and the orientation of the chambers can be understood as a way to integrate the monument within the landscape, including the heavens. Besides, if particular heavenly bodies and their cycles are considered we could envisage the ways of construction of the social time (and space) in the megalithic epoch in Galicia.

05 WOOD AND STONE: NEW ASPECTS ON BRETON MENHIR STRUCTURES

Author: Dr. Perschke, Reena - Museum Lichtenberg (Berlin) (Presenting author)
Keywords: Megaliths Cromlechs Brittany
Presentation Preference: Oral

The current theory of "wood for the living, stones for the dead" relating to Neolithic structures appears in most cases reasonable. With regard to the Breton alignments and cromlechs in the surroundings of Carnac and Locmariaquer it occurs to be difficult, for the acid soils of Brittany don't allow wooden remains and the historical excavations of the 19th century did not pay attention to possible post-holes.
But some monuments like the tumulus of Manio under the alignments of Kermario or the double cromlech of Er Lannic contain a considerable number of small empty stone cists that are normally interpreted as sepulchral sites. In considering these empty "cists" as not recognised post hole stone packings in the thin humus layer, the menhir structures seem to be accompanied by wooden posts, may it be in a multiphase manner of developed architecture first in wood, then in stone, or as construction aid for the erecting of the menhirs. A digital reconstruction of the posts show e.g. in the tumulus of Manio complex wooden structures inside the megalithic stone architecture.
Another aspect of the wood-and-stone-question is posed by the oval stone settings ("cromlechs") of the region. They are normally interpreted as ritual locations, but a new point of view arises in comparing their special shape with the oval wooden palisades surrounding Neolithic long houses in the Breton heartland. Possibly, the cromlechs of Brittany are misinterpreted farm fences made of local stone in the sparsely wooded coastline.

06 POSTS USED INSTEAD OF STONES : EARLY BRONZE AGE ALIGNMENTS IN LINSMEAU SHOWING A POSSIBLE ASTRONOMICAL INTENT

Author: Archaeologist Heller, Frederic - Public Service of Wallonia (Presenting author)
Co-Author: Dr Ing Zotti, Georg - LBI ArchPro, Vienna; Dr Motta, Silvia - INAF; Osservatorio di Brera (Milano); Dr Gaspani, Adriano - INAF; Osservatorio di Brera (Milano)
Keywords: archaeoastronomy protohistory Skyscape
Presentation Preference: Oral

The site of Linsmeau is located in a depression at the foot of the plateaus of the middle Belgium on a colluvial beach north of the Petite Gette River, an affluent to the Scheldt River basin. This part of Belgium is devoid of rocky outcrops, wood on the other hand was available, wood was used to replace stone where no stone was available. A series of 15 unusually deep rooted post holes were uncovered there during the excavation in 2014.
Though few in numbers, they are atypical and they all reach and bore into the underlying sandstone bedrock, at a depth of up to 1.4 meters. The position of the posts, diameter and wide spacing rules out the idea that they could have been used as part of a building. Furthermore, all of the posts show clear evidence of being ripped out from their holes, and, for the first time in Belgium, peculiar orientations were noticed (Heller et al.,02- 2016), then, in a first study that analyzed a georeferenced 3D model visualized in Stellarium 0.14.3 (Heller & Zotti, 2016), relevant astronomical computation showed the occurrence of several alignments of many couples of posts towards the rising point of the moon at the extreme northern declination and the setting at the southern extreme one, of the sun at summer solstice, but also , with minor probability, to the rising sun at the cross-quarters days .
Statistical analyses of the orientations of the alignments were also carried out to determine whether or not the orientations we had found were due to chance factors. In this paper, we discuss our methods and reveal the probable orientation foci of the site and propose that there could be an astronomical intent in the placing of the deep posts found at Linsmeau.

07 A PREHISTORIC CALENDAR AT DROMBEG STONE CIRCLE RECONSTRUCTED BY IDENTIFYING MEANINGS OF STONE SHAPES AND EXPLAINING THE DIFFERENT PLANNED SPACINGS

Author: Professor Meaden, Terence - Oxford University (Presenting author)
Keywords: Calendar, standing stones,
Presentation Preference: Oral

Meanings for the differences in stone forms and stone-to-stone spacings at Drombeg Stone Circle in Southern Ireland are discussed. Most of the standing stones are tall, narrow and straight-sided; they are spaced unevenly around the perimeter of the circle. Two other stones on the circumference are broader than they are high. One is lozenge-shaped, the other is two metres long and lies recumbent. The latter has a vulva carved on its level flat top. Both megaliths may be classified as symbolically female. The upright, narrow, straight-sided stones are symbolically masculine. One of them bears a fully realistic pecked image of an ithyphallus. It is shown how the stones were intelligently positioned such that at sunrise on eight dates of the year 45 to 46 days apart starting with the winter solstice, the shadows of selected male-type stones fall upon one or other of the two female stones. The lozenge receives a male shadow on chosen dates in the winter half of the year. The vulva on the upper surface of the recumbent stone receives a male shadow from particular stones for prearranged dates in the summer half of the year. These discoveries establish the basis of a 365-day Neolithic/Bronze Age calendar while also harbouring a suggested deeper meaning involving a mythical worldview (known as the hieros gamos) about divinities as part of the community's belief system. In short, the layout of the stones at Drombeg shows it was planned as a calendrical sunrise monument with watchable shadow spectacles. Similar findings have been made at other stone circles in Ireland, Scotland and England.

08 ARCHAEOACOUSTICS - SOUNDS OF THE PAST

Author: W. Tjellesen, Lise - University of Reading (Presenting author)
Co-Author: Colligan, Karen - The Archaeoacoustic Research Society
Keywords: Archaeoacoustics, sound, structures
Presentation Preference: Oral

Over the past 5 to 10 years the interest in the topic of Archaeoacoustics has increased with several investigations taking place in ancient structures all over the world. The locations being chosen based on individual experiences of strange and unexplainable sound phenomena. All these investigations have primarily been done as archaeological studies conducted by archaeologists and anthropologists with interest in sound, and mostly with limited input from actual acoustician's. Also very few common approaches have been established and used to support the investigations. So what is Archaeoacoustics? How can acoustics be applied to archaeologic research? The established science of acoustic research and consultancy already have an extensive range of standards, methods, methodologies and tools available when investigating the behaviour and nature of sound phenomena including knowledge of how to link them to the human perception and interpretation of sounds. This paper will discuss the history and varying aspects of Archaeoacoustics primarily from an acoustic point of view by showing how acoustic knowledge can be applied with modern techniques in and around Ancient sites, temple complexes etc. and

help piecing together sound environments from the past and brought to life as a tool for archaeologists and historians for support and maybe even for explaining certain auditory features of ancient structures and other historic sites. The methods are illustrated with application to actual investigations, such as archaeological investigations of Stonehenge in the United Kingdom by summarising previous work carried out by several academic teams at Stonehenge, by reporting the latest results of further applications of computer modelling techniques involving room acoustic simulations, and by making suggestions of future work and development of new methodologies for linking acoustic techniques to archaeological investigations in order to expand the understanding of sound in ancient times and how pre-historic humans may have perceived these sounds.

388 THE "GREAT DIVIDE" ONCE MORE? ARCHAEOLOGY IN THE NORTH AND SOUTH OF EUROPE

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author: Voutsaki, Sofia (Netherlands) - Professor of Greek Archaeology, University of Groningen
Co-Author(s): Kotsakis, Kostas (Greece) - Professor of Archaeology, Aristotle University of ThessalonikiBarreiro, David (Spain) - Researcher, Institute of Heritage Sciences, Spanish National Research Council
Keywords: crisis, politics, funding, research, employment
Presentation Preference: Round table

The 2017 EAA meeting has asked us to reflect on the role of archaeology in the project of European integration. In this Round Table we would like to focus on what we perceive as a growing divide between the north and the south of Europe. This divide feeds on earlier differences (Classical archaeology versus European prehistory or historical archaeology), but these differences were largely being bridged in the last decades.
However, the financial crisis, the ensuing austerity measures and pre-existing pathologies are once more opening up the gap between north and south, though this time the divide is one of opportunities rather than of approach. We are aware that the crisis has affected both northern and southern Europe; we therefore do not want to reify, but rather to explore and problematize any new emerging asymmetries. We aim to investigate the situation in different sectors, namely in higher education, in research, in state and commercial archaeology, and would like to explore funding and employment opportunities, as well as access to knowledge and resources. In addition, we would like to reflect on two issues: First, how we can collect data, and document more clearly the impact of the crisis in both north and south. Second, how we can pursue this discussion further in order to suggest (not only economic but also political) solutions and attempt to bridge emerging asymmetries. After all, the main theme of the EAA 2017 meeting is "Building Bridges".

01 THE "GREAT DIVIDE" ONCE MORE? AN INTRODUCTION TO THE DISCUSSION

Author: Prof Dr Voutsaki, Sofia - Faculty of Arts, University of Groningen (Presenting author)
Keywords: crisis, Europe
Presentation Preference: Oral

In a short introduction to the discussion, I would like to present (on behalf of David and Kostas, but also the many other colleagues who joined the discussion) the rationale behind this Round Table discussion. All three of us come from southern European countries, and can report from personal experience the impact of the crisis on our colleagues, on the monuments, and on the discipline as a whole. But we also realize that the crisis has affected the northern European countries as well, and we know all too well that pre-existing problems and pathologies have played an important role. We therefore want to open up the discussion, compare experiences, but also, as much as we can, compare data and figures by examining the impact of the crisis in different sectors (higher education, research, state archaeology, commercial archaeology), and in different countries in both the south and the north of Europe. We want to explore and problematize what we perceive as a growing divide, and not simply lament or protest about it. We want to adopt a critical attitude – we believe that the crisis in archaeology is only one aspect of a deeper crisis in Europe, in the humanities and the arts sector, in the higher education, in research funding, and is part and parcel of deep political asymmetries. But we also want to be pragmatic: We may not be able to solve the big problems (and we do not even have to agree as to what has caused them); we can, however, explore solutions in our field, suggest measures we or the EAA can take, and attempt to bridge any emerging divisions.

02 DEVELOPMENT LED ARCHAEOLOGY IN SWEDEN

Author: Dr Skyllberg, Eva - Swedish National Heritage Board (Presenting author)
Keywords: Development-led Archaeology Sweden
Presentation Preference: Oral

In my presentation I will address issues about the basic conditions for the development led archaeology in Sweden; funding principles, competition, documentation, publishing and communication of the results etc. In the recent decades important steps have been taking towards a more research based archaeology and much effort is put into making the results available also for the general public. Although, quality issues is always on the agenda and archaeology is still questioned by developers.

03 ARCHAEOLOGY IN TURKEY

Author: Prof. Dr. Hürmüzlü Kortholt, Bilge - Süleyman Demirel Unv (Presenting author)
Keywords: sustainable cultral heritage
Presentation Preference: Oral

This paper aims to present the problems we are facing in order to finance or organizing the archaeological projects in Turkey. This is important for the cultural heritage management and related with sustainable protection of the cultural heritage

04 ITALY IN THE CRISIS: PERSPECTIVES OF ARCHAEOLOGICAL RESEARCH

Author: Full-time Researcher Vanzetti, Alessandro - University of Rome La Sapienza (Presenting author)
Keywords: Italy, Crisis, Archaeological-divide
Presentation Preference: Oral

The question posed by the session deserves accurate analysis: is there a great divide between South and North in archaeological research? And is this divide connected to the post-2008 crisis? The paper tries to show how the situation of Italy is complex, as it faces a mixture of different situations.
As for education, the "Bologna process" has brought to contradictory situations, partially embedded in the typical local academic milieu.
As for research, internal Italian funding is undergoing a general reduction, with fewer field projects being developed; on the contrary, also due to political world situations and the blockage/restrictions of foreign field research in many North African and Near Eastern countries, some more foreign research missions are apparently targeting Italy. This apparent balance of internal decrease and external investment has to be clearly evaluated, in front of figures to be obtained from generally obscure and dispersed data. A method of data mining has to be envisaged.
The resulting pattern can likely display an increasing separation of field initiative from local institutions, increasing therefore a dependance of Italian archaeology on foreign initiaive. The situation has to be carefully evaluated, and matched with other European situations.

05 FROM THEORU TO REALITY: ITALIAN ARCHAEOLOGY IN THE 2010S

Author: Phd Cella, Elisa - Confederazione Italiana Archeologi
Co-Author: Phd Pintucci, Alessandro - Confederazione Italiana Archeologi (Presenting author)
Keywords: Valletta, rules, standards
Presentation Preference: Oral

As well known, economic crisis has profoundly affected European countries of the Southern Mediterranean area. In Italy, where archaeological and construction labour market are deeply connected, after the boom of preventive archeology works in the first half of the 2000s, both the lack of infrastructural programmes and the building sector crisis have diminished the number of excavations and, therefore, the number of field archaeologists: the Country, leader in cultural tourism, has seen both professionals and cultural institutions shifting from on field activities to promotion and scientific popularization ones.
In the meanwhile, the birth and growth of professional associations of archaeologists stemmed these phenomena by asking for specific laws, often managing to get them. However, Italian archaeology is facing a paradox today, since professionals of Cultural heritage have been recognized by law (2014) and Valletta Convention has been ratified (2015), while statutory regulations have not turned these achievements into reality yet.
Are we facing the necessity, both for commercial archaeologists and public organizations, of a general rethinking of protection rules and archaeological works planning?
As a matter of fact, Italy produces very precise laws on paper, poorly applied in reality: this paper aims at discussing, in such a bueraucratic context, what are the consequences and prospects for Italian archaeologists in the future. We will focus on the bias between academia and professional practice and the one between Italian and European archeologies.

06 THE FIGURES OF ARCHAEOLOGY: AN OPPORTUNITY TO THINK

Author: Research Assistant Varela-Pousa, Rocío - Instituto de Ciencias del Patrimonio (Incipit) (Presenting author)
Co-Author: Dr. Parga-Dans, Eva - CICS.NOVA, Universidade Nova de Lisboa; Group of Territorial Studies (GET), Sociology Faculty, University of A Coruña; Dr. Barreiro Martínez, David - Instituto de Ciencias del Patrimonio (Incipit); Research Technician Sánchez Martín, Raquel - Instituto de Ciencias del Patrimonio (Incipit)
Keywords: Commercial archaeology, Asymmetries,
Presentation Preference: Oral

A few years ago, the Incipit started a research line aiming to characterize, attending to socioeconomic terms, the commercial archaeological sector in Spain. Several surveys were conducted related to the DISCO Project, which had a similar objective at the European level.
The first survey in Spain was made in 2009, at the beginning of the current financial crisis; the second one was made in 2012, and it was possible to see then the devastating effects of the crisis in the sector. We are trying to set up a third survey with the ambition of getting to know the current trends and dynamics of the sector, in a context of crisis overcome (attending to what politicians say), when the activity model arise from the La Valetta Convention is being questioned, and a context of people´s mobilization and politicization (who are demanding to actively participate in heritage management).
This is also the context behind NEARCHing Factory, an international event that has been recently organized by the Incipit within the framework of the NEARCH Project, whose objective was re-think the practice of archaeological activity to try to formulate more sustainable models, from an economic and social point of view.
In this session we will present the figures and the evolution of the Spanish commercial archaeology in the last few years, aiming to compare different European countries and to be able to raise some questions related to the main ideas addressed during NEARCHing Factory, like the ones advanced in the session summary: Is there an archaeology of the north and an archaeology of the south in Europe?. Is it even possible to detect asymmetries within each country, in similar terms? If so, is it possible to overcome those asymmetries? Can archaeology contribute to the construction of a more cohesive and inclusive Europe?

390 THE MESSAGE, NOT THE MEDIUM: IMPROVING LECTURING AT INTERNATIONAL CONFERENCES.

Theme: 6. Interpreting the archaeological record
Author: Collis, John (United Kingdom) - University of Sheffield
Co-Author(s): Pearce, Mark (United Kingdom) - University of NottinghamLodewijckx, Marc (Belgium) - University of Leuven
Keywords: Lecturing Teaching Training CPD
Presentation Preference: Session with a key note speaker with contributions from discussants and discussion
Speaker: John Collis and Mark Pearce

We often present our research to the largest audiences at conferences, in many cases much larger than the numbers who read our scientific papers. It is therefore important that

we maximise our impact by giving the best presentation we can, especially when we are addressing an international audience as at the EAA. For many years the EAA has offered written advice on how to communicate in lectures and posters, though trying not to be too prescriptive – there is no right way to present a paper, but there are simple mistakes which can be avoided. There are many excellent papers given, and one way is to observe and copy the techniques of the best presenters, but there are still too many lecturers (and not only people new to lecturing), who make poor presentations and have clearly not read or followed the advice.
This session, supported by the EAA Board together with the Committee for Teaching and Training aims to discuss how we can best promote good practice, not only at the EAA but also at all conferences, and how we can best help students who are not given training at their institutions. We shall deal with common mistakes by presenters, how to prepare a lecture, with tips for more effective presentation. The session is aimed not only at those wishing to improve their own presentations, but especially at those responsible for training young professionals and how to incorporate it into Continuing Professional Development for more established lecturers.

01 THE IMPENETRABLE ABSTRACTION OF OBSCURITY: BEFORE AND AFTER THE COLON

Author: Mr Hinton, Peter - Chartered Institute for Archaeologists (Presenting author)
Keywords: Inaudible, incomprehensible, arrogant
Presentation Preference: Oral

This awful presentation will explore archaeological presentation in real-time, with detailed illustrations and expositions. It will take some simple, well understood concepts, strip them of meaning and enrich them with complexity, using language, illustrations and styles of presentation that will prove enormously pleasing to the speaker.
Can you hear me at the back?

02 CONFERENCE PRESENTATION: SOME DOS AND DON'TS

Author: Professor Pearce, Mark - University of Nottingham (Presenting author)
Keywords: Presentations, PowerPoints, speaking
Presentation Preference: Oral

Why do non-native English speakers find it easier to understand other non-native English speakers' presentations than those of native English speakers? Why is less more in PowerPoint slide design? How many concepts should we try to convey in a 15 minute presentation? Conference presenting is a form of marketing – the speaker sells their ideas. In this presentation I shall explore some common mistakes by presenters at conferences, and show how some simple rules can ensure success in communication.

03 INTRODUCTION

Author: Professor Collis, John, Ralph - Retired / Sheffield University (Presenting author)
Keywords: lecturing PowerPoint conferences
Presentation Preference: Oral

I will introduce the theme and the hoped-for outcomes of the session dealing with topics such as how to encourage lecturers, especially experienced ones, to read the EAA advice, how we might provide training for less experienced lecturers, and how we can best disseminate good practice throughout the profession.

392 MEDITERRANEAN SURVEY IN DIALOGUE

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Means, Anna (Netherlands) - University of Amsterdam
Co-Author(s): Stissi, Vladimir (Netherlands) - University of AmsterdamNazou, Margarita (Belgium) - Université catholique de Louvain; Belgian School at Athens
Keywords: Survey, prospection, methodology, Mediterranean/European, integration
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Over the last half century, intensive survey has become standard practice in the Mediterranean. Although there are several academic traditions, which use different methodologies according to their research questions, scale and scope of investigation, we have a well-functioning scientific community. Within this community, there is a divide between those doing more intensive, find-based surveys and those researching larger regions through extensive investigation and comparisons of sites and architecture. Even though the two meet and use each other's results, integration remains rare.

Moreover, this community is itself isolated within contemporary European archaeology, even though both often have similar goals and methods and many regional projects explicitly address issues on a transnational scale (like for example the Roman Empire).

The aim of the session is to (re-)connect the Mediterranean regional survey community to its European counterpart. We want to stimulate discussion on methods, and also to encourage research towards more integrated, multi-scalar approaches in landscape archaeology. Finally, we hope that by bringing together both communities, we can create new cooperations, also forming a basis for projects which could transcend the traditional divide between the Mediterranean and Northern Europe. We will invite speakers working in different areas and periods all over Europe, whose survey projects examine several scales and use both intensive and extensive methods, and who use material-based approaches and more abstract perspectives. Moreover, we will leave room for papers outside our own networks and with different research approaches.

01 THE INTENSIVE SURVEY AT PREHISTORIC AYIOS VASILIOS: A STEPPING STONE FOR A EUROPEAN RESEARCH PROJECT

Author: Dr Wiersma, Corien - University Of Groningen (Presenting author)
Keywords: BronzeAge, survey, Europe
Presentation Preference: Oral

When preparing a survey methodology for the prehistoric urban settlement of Ayios Vasilios (Laconia, Greece), it was possible to draw on a rich body of (theoretical) literature on (urban) survey and more specifically survey in the Mediterranean. However, much less literature is readily available on survey projects in eastern or central Europe. This is to some extent caused by the divide in the so-called mainstream and minorities within archaeological traditions, which is partly caused by much post-war unrest in these areas. As a result, innovation and methodological developments are more likely to come from the mainstream, in this case Mediterranean based archaeology, carried out by Americans, British etc.), while the minority follows behind.

If we want to build a bridge between survey archaeologies in the Mediterranean and those in eastern and central Europe we should perhaps not start with focusing on survey methodologies and strategies. After all, from a European perspective there is no single correct methodology. Each regional project has its own potential, and different forms of activity-traces have been preserved in different landscapes. Instead, we should start with seeking out common and overarching research questions or concepts, to translate one form of evidence into another.

The survey project at Ayios Vasilios, can be characterized as of 'local' and 'national' relevance. It aims to reconstruct the development and emergence of a central place (namely a Bronze Age palatial or urban settlement) and to explore various methodological issues with respect to field survey and geophysical survey. This paper explores in what kind of ways the current project can be used as a stepping stone for a European research project that builds a bridge between southern Europe and eastern/central Europe.

02 NEW SCHOOL POTTERY STUDIES FOR UNDERSTANDING CULTURAL CONNECTIVITY IN MEDITERRANEAN LANDSCAPES (LATE BRONZE AGE-EARLY IRON AGE)

Author: Dr Ippolito, Francesca - University of Groningen
Co-Author: Dr Fasanella Masci, Marianna - University of Groningen (Presenting author)
Keywords: Pottery, Connectivity, LBA-EIA
Presentation Preference: Oral

Research in Northeastern Calabria carried out by the Groningen Institute of Archaeology in the framework of the Raganello Archaeological Project, proves that a remarkable development of Late Bronze Age-Early Iron Age sites took place on the foothills surrounding the Sybaris plain. Material culture at these sites bears cultural traits related to Aegean influence, but these were reworked to suit the new social organization. In order to understand in which archaeological framework the following Greek colonization took place, we should research this complex pattern of long term Bronze Age and EIA connectivity, specific high visible networks such as the Aegean connection, and internal settlement dynamics.

At the site of Timpone Motta, coarse impasto sherds, matt-painted and Grey ware fragments dating between the LBA and the EIA were found. Grey ware, which according to previous studies derives from an Aegean production, was in use together with impasto and matt-painted pottery which differ in fabric and in aspects of production. Even if fabrics correspond to specific functions, different production techniques need to be explained, in order to understand the perception that the local population had of foreign input. These choices reflect a new social organization influenced by economic and cultural factors that we would like to explain through this paper.

Moreover, since the bulk of LBA-EIA survey site assemblages are mostly made up of non-diagnostic coarse impasto, we would provide, by crossing different but contemporary pottery productions, a pilot study aimed to make the majority of coarse survey sherds diagnostic.

To understand what happened in the transition period LBA-EIA in a Southern Italian region, we therefore suggest using the information provided by pottery characterized by Aegean material cultural traits as a contribution to reconstruct an objective archaeological framework to evaluate foreign and local cultural interactions.

03 THE OCEAN BETWEEN US: COMPARING ARCHAEOLOGICAL SURVEY IN THE MEDITERRANEAN AND THE MIDWEST

Author: Dr TANKOSIĆ, Žarko - Norwegian Institute at Athens; Indiana University (Presenting author)
Co-Author: Watts Malouchos, Elizabeth - Indiana University
Keywords: survey, archaeology, methods
Presentation Preference: Oral

In this paper we draw from our experiences working in both the Mediterranean and the American Midwest to analyze and compare approaches to archaeological survey in the two regions. We tackle this issue from the perspective of aims, methods, procedural issues, and legal frameworks. In addition, we briefly analyze the results in terms of scientific and 'real world' impact and effectiveness. A clear, albeit tentative, pattern of similarities and differences emerges that suggests the existence of transferrable sets of skills and methods between researchers working in the two areas. In addition, we speculate on a possible set of solutions to methodological and other issues that can be successfully transferred between the two traditions.

04 SURVEYING ISLANDS IN EUROPE: BRIDGING THEORETICAL PERCEPTIONS AND METHODOLOGIES

Author: Dr. Nazou, Margarita - Université catholique de Louvain (Presenting author)
Keywords: islands, pedestrian survey
Presentation Preference: Oral

Islands have traditionally been considered as ideal places to conduct surveys, mainly because of their geographical and cultural discreteness (the much criticised 'islands as laboratories' approach). The Mediterranean islands have been investigated mainly through pedestrian surveys, and a rich body of data on colonisation, abandonment and island lifestyles has emerged, especially in the last two decades. Other island groups in Europe, such as the Scottish islands, have been investigated through pedestrian surveys, which also record topography and standing monuments in order to understand land use through time. This paper will examine several case studies of island surveys in the Mediterra-

nean (mainly the Aegean islands) and the Scottish isles in order to highlight similarities and differences in survey theory and methods. An attempt will be made to compare survey results and highlight situations, where the same questions were answered with different ways. While intensive Mediterranean type survey is not always applicable to other islands in Europe, it is interesting that the basic questions on islands are the same across Europe and this could be used to create bridges, which could reconcile methodological differences.

05 LJUBUŠKI ARCHAEOLOGICAL PROJECT: 21ST CENTURY SURVEYING AND PROSPECTING IN DIFFICULT DIALOGUE WITH 19TH CENTURY AUSTRO-HUNGARIAN SCHOLARSHIP

Author: Dziurdzik, Tomasz - Institute of Archaeology, University of Warsaw (Presenting author)
Keywords: survey, legacy data
Presentation Preference: Oral

Ljubuški Archaeological Project is the name for Polish-Herzegovinian research cooperation in non-invasive archaeology in the area of Ljubuški community, Bosnia and Herzegovina. Currently the research is being carried out under a Polish National Science Centre grant 2015/19/N/HS3/00886 in the PRELUDIUM 10 funding scheme. The area in question was in antiquity the immediate hinterland of the Roman colony Narona, one of the major cities in the province of Dalmatia, and as such, the remains from the Roman period form the focal point of our research interests. Due to the civil war and collapse of Yugoslavia in the 90s, the whole Bosnia and Herzegovina experienced a long break in archaeological research, and today is still more widely known for the fraudulent "pyramids" than for its rich historical heritage.

But even during the relatively peaceful Yugoslav period the local archaeology of Herzegovina suffered from a lack of intensive and coordinated research, and also of inadequate heritage protection. In addition, most of the earlier research was published in German, and insufficiently disseminated among the local scholars. As a result, when we started the research project in 2015, we had at our disposal various incompatible sets of legacy data. Over the course of verification in the field, it turned out that Carl Patsch, the Austrian founder of the Bosnian-Herzegovinian archaeology remains one of the most important source of information. However, things have changed quite dramatically in the meantime, with the destruction of most objects he was able to see still in good shape. As such, the whole project turned into a complicated dialogue between surveys and excavations, heritage protection and destruction, modern equipment and legacy data, Polish and local sets of methods, a dialogue in which a 19th century Austrian fluent (among other) in both Polish and Serbo-Croatian acts as a surprising mediator.

06 INCLUSIVE AND MULTI-SCALAR ARCHAEOLOGICAL SURVEY OF LARGE AREAS: LOOKING FOR THE ROMAN ARMY FOOTPRINT IN NORTHWEST IBERIA

Author: Dr Fonte, João - Institute of Heritage Sciences (Incipit), Spanish National Research Council (CSIC); Department of Archaeology, University of Exeter (Presenting author)
Co-Author: Dr Costa-García, José Manuel - University of Santiago de Compostela; Vrije Universiteit Amsterdam
Keywords: Roman-camps, geospatial-technologies, archaeological-survey,
Presentation Preference: Oral

Placed in the periphery of the Mediterranean world, the North-western Iberian territories are characterised by the complexity and heterogeneity of their landscapes: high mountain ranges, steep valleys and densely forested areas exist together with broad extensions of plain crop fields and hilly farmlands. In order to detect new evidences of the Roman military presence in this huge area, we developed a comprehensive, multi-scalar methodology based on the combined use of several remote sensing techniques (mainly airborne LiDAR, aerial photography, satellite imagery). In this way, we tried to overcome not only the inherent limitations of every resource, but also the problems derived of the political fragmentation of this area. The territory is divided between two modern countries (Spain and Portugal) and some autonomous regions (Galicia, Asturias and Castilla e León), and this has a strong impact on the degree of accessibility and heterogeneity of the geographic datasets.
In a second stage, every possible archaeological feature detected by these means was checked on field. This gave us the possibility to better document the structures by using other techniques (aerial photogrammetry, micro-topography). All the data gathered was integrated in a GIS environment in order to implement locational, morphological and spatial analyses. The use of this methodology not only led to the discovery of new sites, but also supported the development of new historical narratives on the conquest and occupation of this territories in Roman times.

07 ARCHAEOLOGICAL SURVEYS THROUGH THE LENSES OF A STUDY OF ANCIENT URBANISM: ROMAN THRACE

Author: Dr Willet, Rinse - Leiden University (Presenting author)
Co-Author: Dr Donev, Damjan - Leiden University; Dr Karambinis, Michalis - Leiden University
Keywords: Surveys, Thrace, urbanism
Presentation Preference: Oral

Being a part of three different national archaeological agenda's has poorly served the archaeology and history of ancient Thrace. The number and quality of archaeological and historical studies is greatly variable across the different countries that inherited the territory of ancient Thrace and in the better studied parts the research focus has often been limited to particular time periods. Modern survey techniques hardly saw any application in this region and in many cases the knowledge of the ancient sites is limited to the epigraphic references or to standing monuments.
With this background in mind we will try to synthesize the existing legacy data for the towns of early Roman Thrace. The research was carried out within the framework of the project 'An Empire of 2000 Cities' allowing the authors to follow the urban pattern across modern national borders. Thanks to this combined effort we are able to present an updated map of the autonomous towns of the Roman province and discuss a set of basic parameters for most of the individual towns. These will include walled or built-up areas, the founding dates and the types of micro-locations occupied by the Thracian towns during the period in question.
The systematic study of the urban patterns in the province has sharpened our perspectives to the gaps in the archaeology of Roman Thrace. We will end by indicating a number of specific research problems, not necessarily related to urban archaeology. In fact we will stress the great potential of ceramic surveys and other non-destructive prospection techniques to contribute to this field. Much is expected, especially from the systematic study of the secondary agglomerations and different sections of the countryside.

08 A TALE OF CITIES AND METHODS: DEVELOPMENTS IN URBAN SURVEY COMPARED.

Author: Professor Stissi, Vladimir - Universiteit van Amsterdam (Presenting author)
Keywords: urban survey, methodology
Presentation Preference: Oral

Over the last years, I have formed part of a large international team that is preparing the publication of the Boeotia Survey project in Greece, including a unique series of urban surveys, covering five relatively large city sites (Thespiai, Haliartos, Hyettos, Tanagra and Koroneia) in a single region, with a similar history. During the three decades of fieldwork involved, methods of research, technologies used, and expertise in find processing have continuously developed, sometimes dramatically, e.g. through the introduction of large scale geophysical prospection, or sophisticated electronic databases. Obviously, this also affects the resulting interpretations. In my paper, I want to evaluate the impact of these changing possibilities and methods on the interpretation of our urban surveys, not only within the context of the Boeotia project, but also in the wider, European context which is the focus of this session. In other words, I would want to explore what 'Boeotia' has learned from ongoing developments in survey archaeology, but I would also like to give some indications of what others could possibly learn from our experiences -- which are based on an unusually large dataset allowing highly detailed analyses in a very well studied area. What can we learn from such very labour-intensive work? What are limitations? Is it worth it? What have we missed in projects elsewhere and could still be done? Finally, I want to stress, and hope to show in my paper, that I think it is important that such evaluations go beyond the traditional, and in my view by now artificial, boundaries between Mediterranean and 'European' archaeologies.

09 REFLECTING ON 25 YEARS OF ARCHAEOLOGICAL SURVEY IN THE SAGALASSOS TERRITORY (SW TURKEY)

Author: Dr. Vandam, Ralf - University of Leuven (Presenting author)
Co-Author: Dr. Kaptijn, Eva - Royal Belgian Institute of Natural Sciences
Keywords: Survey Methodology, Anatolia
Presentation Preference: Oral

The Sagalassos Archaeological Research Project has a long history of archaeological survey research that aims to contribute to the project's mission of documenting the long-term development of socio-ecological systems in the territory of Roman imperial Sagalassos (SW Turkey, Burdur province). Over the years different methodologies, ranging from reconnaissance surveys to intensive tract walking and from urban survey to coring, have been implemented according to the different research questions and scales of examination of our project. In addition, the survey designs had to meet with the variety of landscape units of our research area within the Western Taurus Mountains and thus had to deal with different terrain conditions, and rates of accessibility and visibility. In this paper we present how we approached the archaeological survey research at Sagalassos and how it developed through time. It will discuss how comparable and reliable the results of the survey programs in different sections of our territory are. Via this retrospective view we want to shed light on the merits and shortcomings of our survey research, which difficulties we are currently facing and what paths we want to set out for our future research.

10 WE TALK THE TALK, BUT DO WE WALK THE WALK? FIELD SURVEY PRACTICES IN THE NETHERLANDS COMPARED TO THE MEDITERRANEAN.

Author: Drs. Raczynski-Henk, Yannick - Leiden University (Presenting author)
Keywords: CRM, prospection
Presentation Preference: Oral

As a student at Leiden University I participated in an intensive field survey campaign in and around Tanagra in Greece. To prepare for this project, I tried to read up and this and the subsequent fieldwork acquainted me with field survey in the 'classical' sense.
After this summer in Greece I returned to Leiden and to my own field of Palaeolithic Archaeology and never again encountered serious attempts at field surveying with the exception of a project by the State Heritage Service targeting Palaeolithic and Neolithic sites on a loess plateau in the South of the Netherlands. I ended up working as a prospector and archaeologist in Dutch CRM-archaeology, conducting hundreds of smaller and larger projects involving augering, test trenches, geophysics, excavations, but rarely field walking. Granted, the suitability of much of the very young Holocene landscapes of the western part of the Netherlands is limited, but two thirds of the country consists of older sediments, with a much larger prospective payload in archaeological mobilia. Still, even though field survey is often stipulated in research briefs, it rarely exceeds the cursory inspection of mole hills and ditch banks and never takes on any serious dimension worth noting.

In this paper I will argue that a merger of the Dutch tradition of integrated research in increasingly intensive stages with the Mediterranean tradition of extensive field surveys is very much a two way street.

11 SEARCHING FOR CAMPS AND FINDING THE EVIDENCE

Author: Drs. niekus, marcel j.l.th. - Stichting STONE / Foundation for Stone Age research in the Netherlands (Presenting author)
Keywords: Netherlands, Palaeolithic, scatters
Presentation Preference: Oral

In the winter of 2006/2007 a survey project was initiated by the Groningen Institute of Archaeology in cooperation with the Drents Museum. The main aim of this project was locating Middle Palaeolithic campsites in the northern part of the Netherlands. Until 2007 the Middle Palaeolithic archaeological record from this region (c. 120.000-35.000 BP) mainly consisted of isolated finds. The systematic surveys in which amateur-archaeologists, students and professionals cooperate led to the discovery of a very important Middle Palaeolithic surface scatter near a stream valley. In 2011 a small scale test-excavation was carried out at the site, emphasizing the importance of this site for understanding Neanderthal activities across the northern rim of their range. The surveys of this site, the largest one known to date from the northern Netherlands, continue up to the present-day and new artefacts are discovered on a regular basis. Several years ago the surveys resulted in the discovery of a second scatter situated approx. 500 meters from the first one. In this contribution the project, its aims and results will be discussed, as well as the effects of Weichselian periglacial conditions on archaeological sites and artefacts and the chances of their recovery.

12 CETINA VALLEY AS A BRONZE AGE MEDIATOR BETWEEN THE MEDITERRANEAN AND CENTRAL EUROPE – RESULTS OF AN INTENSIVE SURVEY PROJECT

Author: Associate professor Tomas, Helena - Department of Archaeology, Faculty of Humanities and Social Sciences (Presenting author)
Keywords: Cetina, Bronze Age
Presentation Preference: Oral

The paper discusses some of the research issues explored by a systematic survey of the Cetina river valley in southern Croatia (Cetina Valley Survey). During Early Bronze Age a culture developed there – the Cetina Culture – whose material over time got distributed all over the Adriatic basin, Malta and the Aegean. Contacts were especially intense towards the end of the 3rd millennium BC; soon afterwards the Cetina Culture seems to have disintegrated. This culture is known mostly from stone tumuli hundreds of which have been preserved. By contrast, very few settlements are known, but that may reflect our current state of knowledge – the valley has never been systematically surveyed, so it may be an argumentum ex silentio to claim that settlements are poorly preserved. Although the project seeks to answer some general questions concerning the phenomenon of this important Early Bronze Age culture, such as the settlement pattern, the settlement-tumuli relationship, and overall what kind of society this survey could suggest (obviously that is a crucial question, since that very society was capable of spreading its material across the central Mediterranean), the stress would be placed on the relationship with the Aegean. This is chronologically the earliest evidence of the Aegean contacts with the area of the eastern Adriatic coast. Also, the area of the Cetina culture, spread throughout the Adriatic basin, creates a transit zone between the Mediterranean and central Europe. Consequently, it was open to influences of both regions and served as a connector between the two. The Cetina Valley Survey provides a perfect platform for the Mediterranean-European dialogues in terms of respective Bronze Age traditions.

13 EXTENSIVE SURVEY AS MEANS OF DETECTING PLACES OF LIFE & PLACES OF DEATH IN THE HINTERLAND OF THE EASTERN ADRIATIC

Author: Mr. Triplat, Jura - Faculty of humanities and social sciences in Zagreb (Presenting author)
Keywords: survey, Cetina, hillforts
Presentation Preference: Oral

The Cetina Valley Survey in southern Croatia explores contacts between the eastern Adriatic and surrounding regions during the period of the Bronze Age Cetina Culture. In order to understand properly the nature of those contacts, we first need to get a good understanding of all aspects of the Cetina Culture itself. Its most notable features are stone tumuli scattered around the valley in large numbers. Their grave goods include elaborate pottery and various bronze items, mostly knives and daggers, probably used to enhance the social status of buried individuals. The death aspect of Cetina Culture is therefore fairly understood, but its living aspect is not, since very few settlements of the culture are known. The search for Bronze Age settlements in the Cetina Valley (through an extensive survey) is for that reason of paramount importance.
Stone tumuli frequently occur on low hills of the valley. On some hilltops remains of hillforts can also be found. Hillforts are, in general, recognised as an Iron Age phenomenon, but it is not unusual that many of them provide evidence for an earlier occupation. In addition to serving as places of refuge or as lookouts, some may also have been used as places of habitation. Following the developments of landscape archaeology, the role and meaning of hillforts and its surrounding features have been (re)defined over the last several decades.
The aim of this paper is to present data from an extensive survey and landscape study focusing on locating hillforts, stone tumuli and other notable features in the micro-region of the upper Cetina Valley. An attempt will be made to elucidate the nature of interconnectivity between hillforts and surrounding landscape features (tumuli, arable land along the river, pathways, etc.), especially in a context of similar extensive surveys in the Mediterranean and central Europe.

14 ON FINDING AND INTERPRETING RURAL BURIAL LOCATIONS IN THE MEDITERRANEAN AND EUROPE

Author: Meens, Anna - University of Amsterdam (Presenting author)
Keywords: Survey, Burial, Comparative
Presentation Preference: Oral

Archaeological survey starting in the 1970s led to the discovery of the Mediterranean countryside as an archaeological palimpsest of a settled landscape. It made available information from a large area or region, and it allowed archaeologists to study these areas diachronically. In other words, archaeologists were now able to study how people shaped and used the landscape that surrounded them.
Although archaeologists have generally recorded all traces of human presence they encountered in their survey area, usually designated as 'sites', in reality they have often focused on recording habitation sites or settlements. In contrast, the presence of burial sites has received much less attention.
In this paper I will review which surveys in Greece have detected traces of burials and what were the reasons for interpreting these sites as burial sites. Then I will zoom in on the Greek region of Boeotia, where a large area has been surveyed, in which settlements and burial sites have been discovered dating to the Classical and Early Hellenistic periods. It is especially the connection of these small settlement sites, in this case single farms, with burial evidence that is interesting here. Thanks to the written sources we know that the presence of burials on a piece of land is an important clue to its status. So in this case the presence of the dead can inform us about the status of the lived countryside and its inhabitants.
This Mediterranean perspective will be contextualized in a European framework. England will be the case study. How are burials discovered here? What can rural burials in England tell us about the countryside organization and its inhabitants? By comparing evidence of surveys, excavations and written sources, we will see how the phenomenon of rural burial is studied in different spatial and chronological research contexts.

15 A POOR PICK OF POTTERY? REASSESSING THE TYPE-SITE IN MIDDLE HELLADIC 'DARK AGE' THESSALY: THE ALMIROS PLAIN

Author: Turley, Ailbhe - University of Amsterdam (Presenting author)
Keywords: Ceramics, MiddleHelladic, Survey
Presentation Preference: Oral

Studies of Middle Helladic pottery have circled around the dispersal, consumption and local variations of wares such as Minyan and Lustrous Decorated ware. Whilst such popular wares are essential for tracking trends and patterns in ceramic production and use within a larger territory, there remains a need to address an enduring number of questions regarding regional variation, local production and changes in technology (or lack therof) in Middle Helladic pottery on the mainland. Peripheral pottery studies are therefore on

the rise, coupled with the realisation that this kind of research is necessary to gain an accurate representation of past communities, inter-site interaction and socio-technological change. One untapped resource for achieving this aim is survey pottery, and the vast scope of territory it can cover.

Research in the past has been dominated by considerations mainly from large, multi-functional coastal sites. This means when less significant sites (in terms of production and trade) were discovered they were often dismissed as 'poor assemblages', particularly considering the state the ceramics appear in survey. However, modern scholarship has begun to recognise the need to add smaller, rural and hinterland settlements to the dialogue, in order to achieve a more comprehensive and less biased social narrative. The potential of the use of survey pottery in this research will have crucial implications for better understanding local variation and preferences, and cross-site trade and communication. This paper attempts to address the Almiros Plain in the Middle Helladic period from this theoretical approach.

394 ARCHAEOLOGISTS IN A CHERISCAPE-SHAPED WORLD.

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author: Dabaut, Niels (Belgium) - Newcastle University; Ghent University
Co-Author(s): Fairclough, Graham (United Kingdom) - Newcastle UniversityTurner, Sam (United Kingdom) - Newcastle University
Keywords: Archaeology, CHeriScape, Sustainability, Challenges, Cross-Cultural,
Presentation Preference: Format:

Discussion: Four discussants (drawn from the CHeriScape network created by a project funded by PI Cultural Heritage between 2014-16); www.cheriscape.eu) will make brief statements and engage the audience using participatory methods.

Timing:

2 hours – 1st hour discussing five provocative statements (for each, giving the main discussants 3 minutes to respond to one of 5 statements prepared before the session followed by 7 minutes' general discussion); 2nd hour of smaller group discussions using the 'open space' format before a brief concluding statement from the organisers.

Landscape and heritage values are located within culturally-focused, socially-oriented and people-centred contexts, and therefore have the potential to be used as mainstreaming, integrative policy tools. European conventions (e.g. the European Landscape Convention) and policy briefings (COST-ESF SPB 'Landscape in a Changing World') have already argued that landscape is a meeting point and an arena for discussion that encourages participation. The nexus of landscape and heritage has been the focus of a series of five conferences organised by the CHeriScape project www.cheriscape.eu) between 2014 and 2016 and this discussion session explores the extent to which archaeological perspectives on landscape can take forward CHeriScape's results and help bring together natural and cultural perspectives in pursuit of sustainable future change. We aim to consider ways in which archaeology, through the lenses of heritage and landscape, can lead towards a more democratic and inclusive society and to cross-cultural understanding. What practical steps can archaeologists take to contribute to addressing practical and policy challenges facing society? Key themes from the CHeriScape project - climate and environmental change, mi-gration, the abuse of local identity, the potentially dystopian, post-human futures of re-wilding - will provide a framework for the discussion.

395 BEYOND SIMPLISTIC NARRATIVES: CAN ARCHAEOLOGY, LINGUISTICS AND GENETICS GO TOGETHER?

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Haak, Wolfgang (Germany) - Max Planck Institute for the Science of Human History
Co-Author(s): Kroonen, Guus (Denmark) - Institute for Nordic Studies and Linguistics, Njalsgade 120, 2300 Copenhagen SStockhammer, Philipp (Germany) - Institut für Vor- und Frühgeschichtliche Archäologie und Provinzialrömische Archäologie, Ludwig-Maximilians-Universität München
Keywords: archaeology, linguistics, aDNA, isotopes, mobility
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Romantic ideas of the unity of people, culture and language inspired early archaeological studies, which aimed to identify such entities in the material record of the distant past. However, history has shown that this soon culminated in fascist narratives within archaeology and was misused by political forces to scientifically justify war crimes.
Conversely, the ravages caused by warring nations have caused widespread embarrassment within archaeology, to the extent that the possibility of language spreading with people was denied altogether. While migration is not a prerequisite for the spread of language, it is problematic from the linguistic perspective because historical records abound in cases where movements of people are coupled with language expansions.
Recent isotopic and palaeogenetic studies have helped narrowing the knowledge gap on prehistoric mobility, which garnered wide public interest. We are convinced that we as scientists carry responsibilities in interpreting if, how and to what extent population movements can be associated with the spread of languages, and in preventing (ab)use of such data to satisfy particular agendas. This creates a heavy burden on scholars from different disciplines to align facts and frameworks in a meaningful yet responsible way.
Participants rooted in one of these disciplines will present critical and constructive approaches to the integration of archaeological/linguistic/genetic data. They will try to transgress the borders and integrate their results with those from the other disciplines. Each participant will explain the methodological and epistemological issues of her/his approach in order to contribute to an overarching methodological tool-box for integrative analysis.

01 THE ARYAN DEBATE PERTAINING TO INDIA TODAY

Author: Dr. Elst, Koenraad - Pragyata, Delhi (Presenting author)
Keywords: India, Aryan, migration
Presentation Preference: Oral

The most consequential controversy involving linguistics, archaeology and genetics, pertains to the Homeland question of Indo-European, particularly its Asian implication, the Aryan Invasion Theory (AIT) of India. This hypothesis posits a Homeland of the Indo-European (IE) language family outside India, necessitating an invasion to explain the presence of its Indo-Aryan branch inside India. It is challenged by the rival Out-of-India Theory (OIT), which posits India itself as the Homeland.
In linguistics, the initial Romantic-era inclination to assume Indian origins soon gave way to hypotheses of more westerly homelands, with the Pontic area widely accepted till today. The linguistic case for India as homeland is confined to a scholarly fringe; plus some vocal but amateurish interlopers who do their cause more harm than good. Their point is that linguistic evidence is soft and malleable, often circular. Moreover, the expertise to argue (rather than merely believe) the AIT is just as much confined to a few people, because most Indo-Europeanists shun the old Homeland debate.
This is both because of its historical association with British colonialism and the National-Socialism (

02 GENETICS AND GEOGRAPHICAL ORIENTATION OF THE EURASIAN NOMADS (VI-III CENT. B.C.)

Author: Dr. Ochir-Goryaeva, Maria - Chalikov Institute of Archaeology; Kalmyk Research Centre Russian Academy of Sciences (Presenting author)
Keywords: Burials, orientation, genetics
Presentation Preference: Oral

The main result of the recently published paper „Ancestry and demography and descendants of Iron Age nomads of the Eurasian Steppe" suggests independent origins for eastern and western groups with an ongoing gene-flow between them, plausibly explaining the striking uniformity of their material culture .
In my estimation the Eurasian steppes comprise about six thousand excavated kurgans. I have conducted a planigraphic analysis of the kurgans in the seven regions, which shows that in terms of geographical orientation the rising sun was the initial point of departure for a part of the population of the Eurasian steppes of the Scythian epoch (Northern Pontic coast, Lower Volga, Semirechye and Gorny Altai), hence the east-west direction was of primary importance for them; for the rest of the population under study (Southern Cis-Urals, Northern Kazakhstan steppe, the Sayan Plateau of the Republic of Tuva), it was the north-south vector that was of such crucial importance.
This result allowed me to maintain the idea of the Scythian-Siberian unity of the archeological cultures of the Eurasian steppe, where in fact one deals with two distinct cultural communities (2012). My work has shown, there is a logical association between the spatial arrangement of burial constructions (walls, stone embankments, central and secondary burials) in terms of the cardinal points and the ideas that ancient populations held about the location of the world of the dead, as well as their geographical worldview, which belongs to the basic conceptualization of every ethnic group.
The two types of the orientation of the burial constructions of the Scythian epoch go together with the genetic investigation of the western and eastern groups.
To illustrate this, Mongolians' yurts face the south while those of Turks have an eastern orientation. The dwelling orientation was strictly observed as part of the peoples' ethnic identities.

03 MOBILITY AND MIGRATION IN EUROPEAN NEOLITHIC COMMUNITIES – INTEGRATING ARCHAEOLOGY, ANTHROPOLOGY AND MOLECULAR BIOLOGY

Author: Dr. Furholt, Martin - Kiel University (Presenting author)
Keywords: migration archaeology anthropology
Presentation Preference: Oral

After the spectacular biomolecular studies of the last few years, the discussion of migration and mobility in sedentary prehistoric societies in Europe has remained largely restricted very to specific, probably unrealistic scenarios of mass migrations. These are often connected to outdated models of social coherence and the social reification of archaeological cultures. One very common conceptual flaw is to view migration as an external factor, affecting a socially closed group of non-migrants, in this way creating a false dichotomy between migrant and non-migrant groups. In this paper, I want to discuss different phenomena of migration and mobility as an internal component of prehistoric communities, and explore their social consequences, to explore recent anthropological research on migration and mobility that can be helpful for a better understanding of such phenomena and its archaeological record in European Prehistory.
Anthropology informs us that migration is mostly connected to an intermixing of social groups and phenomena of translocality, creating socially heterogeneous, translocal communities. In order to be able to discuss migration and its social consequences, we will also ask the question of its impact in the archaeological record. I will propose a practice-based perspective of the production of material culture, which establishes a connection between the patterns of similarity of material culture on a regional scale, and the structure of social groups on the local level. This will help us to identify specific scenarios of migration and mobility in an interdisciplinary approach.

04 A MULTIDISCIPLINARY APPROACH TO MODELING EXPANSIONS FROM THE FRANCO-CANTABRIAN REFUGE

Author: Dr. Frank, Roslyn - University of Iowa (Presenting author)
Keywords: LGM, Basque, Indo-European
Presentation Preference: Oral

Over the past decade an informal working group of researchers representing three related fields of endeavor, namely, archaeology, genetics and linguistics, has come together to investigate questions that have arisen concerning the viability of utilizing the Franco-Cantabrian Refuge (FCR) theory to probe possible population movements in prehistory.

Members of the group include geneticists affiliated with the BIOMICs research group at the University of the Basque Country, and archaeologists such as Dr. Clive Gamble whose pioneering research on the FCR is well-known, and Dr. Fabio Silva, co-editor of the new Journal of Skyscape Archeology, who is currently working on a collaborative project titled "Late Glacial Human Range Expansions." The project involves data collection and computer modelling of the recolonization of Western Europe from the FCR, starting with the Last Glacial Maximum (LGM). In addition, several Basque linguists, including myself, are participating.

The paper will discuss the advantages that derive from this three-pronged multidisciplinary effort as well as the difficulties that need to be overcome to integrate data generated by each of the disciplines. Particular emphasis is placed on the methodological and epistemological issues arising from this approach as well as how they are being dealt with.

The possible role of the predecessors of modern day Basques—their language and culture—in prehistory, as well as debates that have surfaced in recent years concerning the position of the Basque language vis-a-vis European substrate theories are addressed and critiqued. Evidence for survivals from this substrate—or lack of said—in languages classified as Indo-European will be discussed. Also subjected to scrutiny will be certain debates generated by conflicting opinions in the field of genetics as well as archaeology relating to the FCR model, including conflicting interpretations of results from the analysis of DNA samples dating from the Neolithic period.

05 THE POTENTIAL OF PALAEOGENETICS FOR THE AEGEAN BRONZE AGE STUDIES

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Keywords: Aegean prehistory aDNA
Presentation Preference: Oral

In the last decade, or more precisely, in the last couple of years, very old questions seemed to have been answered, if not decisively, for the most part. Now we know that the Neolithic revolution, at least in its initial stages, did not spread westwards through technology transfer or cultural diffusion, but almost exclusively through demic diffusion. Thanks to aDNA studies, today it became blatantly clear that individuals associated with Afanasievo and Corded Ware cultures were genetically related with Yamnaya individuals, regardless of one's approach to the Indo-European homeland problem.

Aegean Bronze Age studies, however, remained stoically unenthusiastic before the recent developments. Although things are slowly changing, Aegean prehistory and most importantly its Anglo-American component, has been dedicatedly anti-migrationist in the last three or four decades. Therefore, questions such as the arrival of Greek speakers in Greece or the potentially population movement-related causes and consequences of the Early Bronze Age II collapse have been thrown into the pool of passé, antiquated scholarly questions.

Soon, however, this situation is bound to change. Following the example of temperate Eurasia, the prehistoric Aegean too, in the very near future, will be the subject of aDNA studies, with inevitable implications for the questions mentioned above, and others, such as the nature of the Minoan presence in the central Aegean, the nature of the Mycenaean presence on Crete or the spread of Lefkandi I/Kastri group material culture, to name a few.

In this paper, specific areas of research in Aegean prehistory where aDNA revolution might make invaluable contributions will be explored. Additionally, probable scholarly reactions to and potential political (ab)uses of such contributions will be assessed.

06 THE GENETIC ORIGINS OF THE MINOANS AND MYCENAEANS

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Keywords: aDNA, Bronze Age
Presentation Preference: Oral

The Bronze Age archaeological culture of the island of Crete, labelled 'Minoan' by Sir Arthur Evans, was Europe's first literate culture (ca. 3100 BCE to 1050 BCE). The Minoans used two as of yet undeciphered scripts: the Linear A syllabic ideographic and Cretan hieroglyphic. As these scripts could not be definitively linked to languages spoken outside Crete, a vivid scholarly dispute persists as to the origin of the Minoan culture.
In the 15th century BCE, it is believed that much of Crete was occupied by populations from mainland Greece, which replaced the Minoans as the dominant force in the Aegean. These peoples are commonly grouped in the 'Mycenaean' archaeological culture (ca. 1700 to 1050 BCE) and represent the first advanced civilization on mainland Europe. Their deciphered script, Linear B, which was also later used in Crete, proved that Mycenaeans spoke an early form of the Greek language.
Here we present genome-wide data from nineteen ancient individuals, including Minoans from the island of Crete, Mycenaeans from mainland Greece, and their eastern neighbours from southwestern Anatolia. We show that the Minoans and Mycenaeans were genetically highly similar, each tracing at least three quarters of their ancestry from the first farmers of the western Anatolian and Aegean regions, and most of their remaining ancestry from ancient west Asian populations related to those of the Caucasus, Iran, and Armenia. However, the Mycenaeans were genetically distinct from the Minoans in deriving ~13-18% additional ancestry from a source related to Bronze Age inhabitants of the steppe. We discuss scenarios that could describe these migrations into the Aegean and their possible links with language dispersal.

07 SIGN(S) OF THE TIMES? CHARIOTS, THE WHEEL, AND MEANING-MAKING IN THE BRONZE AGE SOUTHERN URALS

Author: Dr. Johnson, James - University of Copenhagen (Presenting author)
Keywords: Signification, Chariots, Bundling
Presentation Preference: Oral

Despite the many technical advancements in genetic, linguistic, and archaeological analyses of the issues involved with the search for the Proto-Indo-European (PIE) homeland and investigating the subsequent spread of the Indo-European language families, many archaeologists still cast a skeptical, if not dismissive, eye towards these efforts. Much

of the seemingly ingrained skepticism is largely due to (at least) two related factors: 1) lack of consideration regarding issues of space and time in terms of social change and impact areas and 2) a very limited conceptualization and use of signification in Indo-European studies. Both factors overlap in significant ways in two problematic areas. The first area is the general lack of knowledge concerning the socio-spatial and temporal dynamics involved in the find contexts of materials, such as the wheel, associated with the 'culture' and languages in question. The second is an assumed homogeneity of meaningfulness for these materials. Both remain severely under-investigated. In the following paper, I build upon the now long-running critique of culture-as-bounded-entity, as well as emerging trend in anthropology exploring meaning as produced and shared by human social groups, using a semiotic approach to investigate the temporal and spatial logics involved in social change and technological adoption/borrowing. Using the concepts of 'semiotic ideology' and 'bundling,' I assess the socio-historical conditions involved in the cultural transfer and display of a specific type of socio-technology: the chariot. Subsequently, I use this case study as a proxy for the Yamnaya to explore the lesser known archaeological and linguistic contexts of the 'wagon' as a form of bundling that may very well contribute an important perspective on the historical connection between material culture and language.

08 EARLY BRONZE AGE FAMILY RELATIONS AND MOBILITY FROM A LINGUISTIC PERSPECTIVE

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Keywords: Indo-European, linguistics
Presentation Preference: Oral

Our paper aims to illustrate how Indo-European linguistics can contribute to the study of Copper and Bronze Age prehistoric Europe and Central Asia. Over the last couple of years, archaeologists have managed to zoom in on prehistoric life in an unprecedented way. Detailed genetic analyses of the bodies that have been preserved in the graveyards of prehistoric settlements now enable us to determine the family relations between these people. Strontium and oxygen isotope ratios in tooth enamel provide information about potential mobility of the same prehistoric individuals. Linguistic data can help to explain the findings. The Copper and early Bronze Age witnessed the spread of the Indo-European languages across Europe and Central Asia. Genetic research has suggested that this spread must be seen as partly due to migrations and partly due to diffusion. The lexicon of the Indo-European languages and early literature written in Indo-European languages indicates how the early speakers of Indo-European languages organized social and family relations through marriage, fosterage and temporary exile. We will argue that a comparison between the archaeological and linguistic evidence for Copper and Bronze Age family and social relations will provide new insights for both disciplines.

09 SEARCHING FOR THE BEGINNINGS OF GERMANIC IN SCANDINAVIA - AN ARCHAEO-LINGUISTIC APPROACH

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Keywords: Germanic, Bronze Age
Presentation Preference: Oral

The date and geography of Proto-Germanic, the latest reconstructable stage of the mother of the attested Germanic languages, is roughly set to between 500 BC - AD 100 in Scandinavia. However, there are a number of reconstructable linguistic developments, exclusive to the Germanic branch, that have taken place before the stage of Proto-Germanic. Logical follow-up questions are: when did the precursor to the Proto-Germanic language begin to be spoken in Scandinavia and can it be associated with a migration of people into Scandinavia or are we merely dealing with a phenomenon of linguistic and cultural influence from. e.g. Northern Germany?
Combining relative chronologies of the earliest loanwords between the Germanic and Finno-Samic language branches with archaeological studies of influence and migration into Scandinavia and the Baltic regions, I will attempt to offer some concrete scenarios in time and space where these loanwords could have been exchanged.
Determining when the exchange of the earliest Germanic loanwords into the Finno-Samic branch happened is not only dependent on migrational hypotheses of Scandinavian archaeology, but also on fixing a date and place of the Finno-Samic languages in the Baltic region. The latest, and most ambitious, hypothesis on the arrival of Finno-Samic languages in the Baltic region combining methods of archaeology and historical linguistics, proposes an arrival of the Finno-Samic languages with the Netted Ware explosion around 1800-1700 BC.
If we can fix these loanword exchanges in time and space by comparing them with flows of influence and migration in the archaeology of Northern Europe, conferring also palaeogenetic studies, we would have better prerequisites for finding the most probable scenario of when the Germanic language branch began in Scandinavia and in turn use the reconstructed vocabulary of this "Pre-Proto-Germanic" language to interpret the archaeology in Scandinavia.

10 IN THE CROSSROADS OF EAST AND WEST: TRACING THE POPULATION HISTORY OF FINLAND WITH ANCIENT DNA

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Keywords: aDNA, Finno-Ugrians
Presentation Preference: Oral

Ancient-DNA studies provide an opportunity to illuminate the origins of modern populations, and to detect their historical changes with an unprecedented precision. The unique genetic structure of modern Finns and the population history of Finland in the crossroads of eastern and western influences introduce a subject well suited for ancient-DNA study. Furthermore, the early migrations and the genetic origins of the Saami people in relation with the Finnish population call for a closer inspection, with the linguistic evidence suggesting Saami languages having dominated the Finnish region before 1000 AD.

To understand the population dynamics leading to modern-day observations, the attention is drawn to the ancient settlements in Finland and its neighbouring regions, predating the Viking expansions and their strong western effect. In the culmination point resides the Levänluhta lake burial in southern Ostrobothnia, yielding the oldest known human

skeletal remains in Finland that are adequately preserved for ancient-DNA retrieval. The site dates back to the Iron Age between 400-800 AD, according to the artefacts recovered, while radiocarbon datings on human bone material from the site span 350-730 AD.

Here we discuss the analyses on genome-wide data, extracted from three individuals from Levänluhta, and compare them with ancient Eastern and Western Europeans, as well as with modern European populations. We observe a trend of strong eastern influence in early inhabitants of Finland, and trace back suggestive transition points of population admixture. Our findings complement the linguistic studies of the Finno-Ugric heritage, and shed light on genetic patterns likely arisen during the last 1500 years.

11 NEW DATA ON THE GENETIC ORIGIN OF EARLY HUNGARIANS (8-10TH AD), AND ITS COMPARISON WITH ARCHAEOLOGICAL, LINGUISTIC AND HISTORICAL SOURCES

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Keywords: Early Hungarians, mtDNA
Presentation Preference: Oral

Different scientific theories exist about the origin of early Hungarians and their migration from North-Central Asia to Central Europe in the 8-9th centuries. The historical and archaeological sources give evidence of a mixed ethnic composition of the Hungarian conquerors arrived in the Carpathian Basin 895 AD, with attached folk elements that joint along the way westwards from the Ural region through the Middle-Volga region (crossing the Khazar Khaganate) and the eastern European steppe. The linguistic research supports the Finno-Ugric origin of Hungarian language, which is the sole Uralic language in Central Europe. However, there are some evidence of Turkic-speaking groups´ influence in the Hungarian language too, which is suggested by ancient Turkic loanwords in the early layer of the Hungarian language, the Turkic origin of person names of tribe leaders of the conquest-period and some toponyms. Nevertheless, the exact source, route and chronology of the migration from Ural region to Carpathian Basin is still unclear and intensively debated by historians, linguists and archaeologists.
With this basis, the aim of our research (funded by OTKA grant 106369) was to approach these different viewpoints with archaeogenetic methods. We investigated medieval (8-11th century) populations in the Carpathian Basin and the Ural region, which territories had archaeological connections to each other and to early Hungarians detected on the steppe. The studied cemeteries were excavated from east side of the Central-Ural (Uelgi) as well as from its west side (Bojanovo, Bartim and Suhoj Log). We analysed 34 complete mitochondrial genomes using bait-capture method and Illumina sequencing, and compared our results to available mitochondrial datasets of the conqueror and modern Hungarians. Our results suggest rather homogeneous character of investigated populations with differences in the proportion of Asian lineages. These however partially match with Asian haplotypes in the conqueror dataset, suggesting genetic connections of the studied populations.

12 TRIANGULATION AND THE SPREAD OF THE TRANSEURASIAN LANGUAGES

Author: Dr. Dr. Habil. Robbeets, Martine - Max Planck Institute for the Science of Human History (Presenting author)
Keywords: Transeurasian, interdisciplinary, triangulation
Presentation Preference: Oral

In my presentation I would like to introduce my current research project, in which linguistics is used as a window on early human and agricultural expansion in North and East Asia. The aim of my paper is to investigate the impact of agriculture on the spread of the so-called Transeurasian languages, i.e. the family consisting of the Japonic, Koreanic, Tungusic, Mongolic and Turkic languages. For this purpose I will integrate linguistic, archaeological and genetic evidence in a single approach, for which I use the term triangulation. Since a synthesis between the three disciplines is still in its infancy, the focus of my paper will be on working out a consistent methodology of triangulation.
In order to avoid circularity each line of evidence should be worked out independently, before the results of the different disciplines can be mapped on eachother. Hence, geneticists, archaeologists and linguists independently apply the tools from their respective disciplines to find an answer on a series of questions with regard to the spread of people, (agri)culture and language. These questions are related to the configuration of the tree-diagram, the geographical location of the common ancestor and subgroups, the dating of the common ancestor and the subgroups, the routes of dispersal, the cause of dispersal, the distinction between cultural diffusion vs. population migration and sex-biased migration patterns. Mapping the variables on eachother is expected to reveal correlations and discordances. The probabilistic basis for possible correlations between the three disciplines lies in the fact that genes are invariably inherited by offspring from their parents, whereas languages and material culture are in many cases but not invariably, inherited by offspring from either or both of their parents. In the proposed contribution, I will examine to what extent the interdisciplinary correlations between the Transeurasian languages may have been disrupted.

396 EARTHEN ARCHITECTURES FROM THE NEOLITHIC TO THE IRON AGE: DETECTION OF STRUCTURES AND CHARACTERIZATION OF BUILDING TECHNIQUES

Theme: 6. Interpreting the archaeological record
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Keywords: Earthen architecture, techniques, archaeological record
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The correct detection of the remains of earthen buildings and structures is often complicated for the archaeologists. In France, for example, their identification on the field is actually a challenge for researchers and it gives problems of scientific policy to the organisms that are in charge of the regulation of the preventive archaeology and the archaeological heritage. The recognition on the field is particularly hard in temperate regions of central and western Europe, especially for the most ancient periods. The comparison

between some most evident structures, preserved in arid contexts or in sites such as tells, and latent or bad preserved structures, as in temperate contexts, can help the development of methods, excavation techniques and interpretation of archaeological findings.
This session will be an opportunity to compare different experiences on the theme of earthen architecture in european and Middle East Prehistory relating to the identification of these structures on the field, the characterization of techniques (mudbrick, cob, wattle and daub, plasters, floors,...) and their decay. Various kinds of site can be presented, from domestic to funerary contexts. The discussion will be focused on the comprehension and interpretation of the rests of walls, buildings and other earthen structures, the understanding of the nature of mudbrick sediments, the ethnofacies and the formation processes of tells. Different approaches are welcomed (archaeology, geoarchaeology, geochemistry, geophysics,...) to present case studies and specific methodologies from preventive archaeology or long-term research projects. Interdisciplinary papers and posters are encouraged, as well as ethnoarchaeological and experimental studies.

01 NEOLITHIC MUD CONSTRUCTIONS: 25 YEARS OF RESEARCH IN THE FIELD OF PREVENTIVE ARCHAEOLOGY IN SOUTHERN FRANCE

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Keywords: Neolithic, earth_building, heritage
Presentation Preference: Oral

The detection of Neolithic earthen architecture was at the heart of a controversy in southern France.
The debate revolved around the veracity of the observations made by archaeologists from the Inrap (National institute for research in preventive archaeology) in the late 90's. Traditionally, this type of construction concerned solely walls made of wood and mud following the wattle and daub technique. However, the existence of wattle walls was never proven, except by the presence of unorganised post holes and slabs of burnt earth featuring vegetal prints. This hypothesis went without saying. Conversely, the existence of construction made of mud bricks seemed unacceptable. Mud constructions were seldom detected and its use seemed reserved for more recent periods, notably the second Iron Age. It is only recently that researches in the preventive area integrated the methods of detection for those difficult to identify materials and learnt to establish an efficient collaboration between archaeologists and geoarchaeologists.
The history of those discoveries and their implication is thus interesting to allow the understanding of what began from the simple observation of the presence of mud elements in dumps to the restitution of buildings. The first discoveries of mud constructions came from the final stage of the Neolithic of East Languedoc (Fontbouisse culture, IIIrd millennium cal BC). They allowed the extension of the detection of this material through time, as early as the ancient Neolithic, and through space, in other regions of France. As of today, the excavation of mud constructions, from early Prehistory to Modern Times became a major issue in patrimonial policies.

02 PRESERVATION ENVIRONMENT AND POST DEPOSITIONAL ALTERATIONS OF EARTHEN ARCHITECTURAL MATERIALS AT MIDDLE BRONZE AGE ERIMI-LAONIN TOU PORAKOU, CYPRUS

Author: Amadio, Marialucia - University of Reading (Presenting author)
Keywords: post-depositional, earthen-materials, Cyprus
Presentation Preference: Oral

The study of earthen architectural materials provides significant evidence to analyze architectural narratives at building and settlement scales. Their analysis enables the study of human selection and procurement of raw materials, the use and negotiation of natural resources, the analysis of production strategies and technological development, and the examination of buildings and settlement construction, use and abandonment processes and related socio-cultural significance. Despite their great informative potentials, the examination of earthen architectural materials, in many archaeological contexts, is limited by their poor preservation.

The Mediterranean climate of Cyprus works against earthen materials preservation as the aridity combined with the rare but strong seasonal precipitations leads to rapid dissolution of these architectural materials, especially after the roof has collapsed. In addition, the geologic and edaphic characteristics of the southern region of Cyprus, which is dominated by sedimentary formation of chalks and marls and calcareous soils, have contributed to the alteration of archaeological deposits and have impacted on the preservation of earthen architectural materials. Despite these limitations, earthen materials recovered from the Middle Bronze Age site of Erimi-Laonin tou Porakou, still retain important information.

The aim of this study, therefore, is to examine post depositional alterations that affected earthen architectural materials at Erimi-Laonin tou Porakou, through integrated micromorphological, geochemical and spectroscopic analyses, and to emphasize the significance of natural and anthropic agencies in the reconstruction of complex archaeological pathways.

03 TAPHONOMIC READING OF RECENTLY ABANDONED MUD HOUSES IN SUPPORT OF PREHISTORIC TELL-DIGGING: THE CASE OF TELL ARBID VILLAGE (NORTHEASTERN SYRIA)

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Keywords: mud houses, taphonomy
Presentation Preference: Oral

One means of the Masaryk University excavation team (Brno, Czech Republic) to cope with the exceptionally bad preservation state of the wall substance at the Late Neolithic Tell Arbid Abyad (Upper Mesopotamia) have been inspections in a field of decayed, traditional mud-brick houses adjacent to the Czech excavation house. The principal aim of the recurrent visits in 2007-2010 has been to acquire a better understanding of the appearance and arrangement of wall debris scatter accumulating next to the reduced wall stumps proper.
The attempt at Tell Arbid Village has had the following outcome: by mutual elucidation indeed some headway in the excavation of highly decomposed prehistoric clay walls can be made. Plans to improve the approach by moving forward from non-invasive photo documentation to targeted measures of (test) excavating, documenting and sampling in the modern field of ruins could not be pursued after 2010.
The session will draw upon the existing stock of photo-material from the modern field-of-ruins of Lower Tell Arbid to show how, in practice, field excavators can use visual observation to get to new insights concerning the principal conversion process of derelict mud houses into the depositional layers found at tells.

04 SETTLEMENTS OF THE SINTASHTA ARCHAEOLOGICAL CULTURE: ORGANIZATION, ARCHITECTURE, AND BUILDING MATERIALS

Author: Professor Koryakova, Ludmila - Institute of History and archaeology, RAS (Presenting author)
Keywords: Settlemtnts, LBA, steppe
Presentation Preference: Oral

The Sintashta archaeological culture represents the late Middle Bronze Age and beginning of the Late Bronze of Southern Trans-Urals. Currently it is dated back to the period of 2100 -1800 cal BC. This culture is characterized by clustered fortified settlements, the pattern of which is unusual for local steppe area. Their interpretation (functional identification, origin of architectural pattern, and so on) is still under debate. This paper will give insights to the results of German-Russian project targeted to the study of settlement system in one microregion of Trans-Uralian steppe area. Here, there are three fortified settlements located in 8-10 km each from another. The new results relating to all directions of the project (archaeology, geophysics, biology, geology and others) are obtained in the course of research. All settlements are geophysically surveyed and revealed clear pictures of their planning and structuring. Their pattern consists of several structural elements: earthen enclosure line (settlement wall, ditch), blocked standard houses forming streets and segments. There are evidences of rebuilding activity. Within the houses, the water wells of various types and periods are discovered and completely excavated. Well preserved wood is produced by the wells. The major building materials are represented by clay (absolutely unusual materials for the area), wood, and stone. Representation of house structures in excavation will be displayed, as well as the change of architectural tradition during the short time will be shown.These processes will be correlated with the mode of life of settlement inhabitants.
This paper is prepared in framework of the Grant of Russian Science Foundation, project 16-18-10332

05 LIVING IN INVISIBLE HOUSES: COMPARATIVE ANALYSES OF NEOLITHIC AND BRONZE AGE DOMESTIC STRUCTURES AT GRADIŠTE IDJOŠ IN THE CARPATHIAN BASIN

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Keywords: Vinca, Gava, Belegiš
Presentation Preference: Oral

The violent end of a Late Neolithic village (ca. 4500 BC) at Gradište Idjoš included a fiery conflagration that destroyed houses. This has three archaeological benefits 1) Domestic assemblages were preserved in situ, 2) Inorganic building materials and impressions of organic building materials in these were preserved, 3) The burning led to strong geophysical signatures so that non-invasive survey has provided a provisional plan of the final occupation phases at this site. This provides excellent resolution data on the final habitation phase on a tell site that began some centuries, possibly millennia, earlier. This in turn provides a basis for considering the more ephemeral traces of activity from earlier phases and attempting to make sense of these during excavation.
Immediately adjacent to this Neolithic village, a Bronze Age to Early Iron Age (ca. 1450-800 BC) fortified site was built. We know considerably less about the structural traditions of this period, not only at the site but for the wider region. As with the Neolithic tradition, it appears that organic materials and daub using the local loess predominates. Excavation has sought to find traces of settlement structures, no matter how ephemeral, but thus far with little success. The reasons for this include the apparent lack of burning of any buildings, the actual structural traditions that did not involve features cut into the earth (e.g. post-holes) and the agricultural use of the land for generations. Nonetheless, through analyses of impressions in daub and some burnt remains, we are building up a picture of the structural traditions in use, potentially including domestic buildings.
In this paper, we will comparatively explore the material evidence for structures from both periods, during which the same landscape resources were used. Through this we analyse material traces for prehistoric "invisible houses" of the southern Carpathian Basin and Balkans.

06 AN EXPERIMENTAL AND COMPARATIVE STUDY OF BURNED AND UN-BURNED WATTLE AND DAUB ARCHITECTURE

Author: Professor Gheorghiu, Dragos - National University of Arts (Presenting author)
Keywords: earthen architecture, experiments
Presentation Preference: Oral

Wattle and daub was a common method of building in the South Eastern Europe Chalcolithic and contributed to the formation of tell-elements.
The houses built using this technique were subject to decay, or were burned down accidentally or intentionally, as the archaeological record suggests. The wattle and daub technique represents a reinforcement of clay with vegetal materials, ranging from straws and twigs to tree trunks, a mix which reacts in different modes in the two situations mentioned. The archaeological experiment plays a critical role in understanding how this composite material works and transforms itself under burning.
The present paper will analyse the behaviour of the structural vegetal reinforcement of clay from the perspective of experimental archaeology, in two case studies: the first will be the presentation of the building and decay of a replica of a Chalcolithic house exposed to weathering for fourteen years, and the second the presentation of a similar reconstructed house burned down intentionally, exposed to weathering for seven years, and later excavated.
A parallel presentation of the two experiments will be focused on the behaviour of the clay (unburned) and ceramic (burned) house walls, and will describe two different processes whose stages are not entirely preserved in the archaeological record.

07 THE ARCHITECTURE OF ÇATALHÖYÜK WEST: OF BUTTRESSES, VANISHING FLOORS, AND PSEUDO-BRICKS

Author: Dr Anvari, Jana - Flinders University (Presenting author)
Keywords: Çatalhöyük, earth building
Presentation Preference: Oral

This paper discusses recent work on the building materials and techniques employed at Çatalhöyük West, the latest (Early Chalcolithic) occupation levels of the large prehistoric site of Çatalhöyük. A combination of visual assessment and geoarchaeological composition analysis was employed with the aim of studying social groupings at the site, and revealed a rich diversity of building techniques and constant modifications to the built environment. Methodological challenges included that the grey, silty nature of the building materials significantly complicated the recognition of many construction details, and that the manner in which houses were abandoned left less well preserved and more difficult to investigate than their Neolithic Çatalhöyük counterparts. Within this framework, the paper reports on the techniques used during and after excavation in the investigation of Çatalhöyük West building traditions.

08 DETECTION OF PREHISTORIC EARTHEN ARCHITECTURE: GEOARCHAEOLOGICAL CONTRIBUTION

Author: Wattez, Julia - INRAP; UMR 5140 ASM
Co-Author: Peinetti, Alessandro - Université Paul-Valéry Montpellier 3, UMR 5140 ASM; Labex Archimede ("Investissement d'Avenir" program ANR-11-LABX-0032-01); Università di Bologna (Dipartimento di Storia Culture Civiltà) (Presenting author); Onfray, Marylise - Université Pantheon Sorbonne, UMR 8215 Trajectoire; Mylona, Pantelitsa - Muséum national d'histoire naturelle, UMR 7209
Keywords: Geoarchaeology, Earthen-building-materials, Detection
Presentation Preference: Oral

The detection and the correct identification of earthen constructed features (buildings and floors) is a general issue during archaeological excavations. This issue is emphasized in prehistoric settlements, where earthen architecture is not yet well documented. During the last two decades, geoarchaeological intra-site researches were carried out in Cyprus, Northern Italy and France on prehistoric settlements dating from the Early Neolithic to the Middle Bronze Age. The geoarchaeological approach, based on micromorphological analysis, aims to characterise the construction techniques (walls and floors) and the post-depositional evolution of these archaeological features. It showed that two key factors are involved in the difficulties encountered during the excavation of these sites: the specific kind of earth building technique and the nature of raw materials, regardless of the geomorphological and pedological contexts. Earthen structures appear to be preserved in both arid and temperate climatic conditions.
Micromorphological analysis revealed that cob was used since the Pre-Pottery Neolithic period in Cyprus and since the Early Neolithic in the South of France. The cob technique covers a wide range of building processes, from walls to floors, expressed by a variety of morpho-sedimentary characteristics, which are often interpreted as a natural formation like colluvium. The used raw materials constitute a second bias to the detection of cob architecture. Micromorphological data show that building materials come from close sources (soils from the local environment, occupation surfaces, etc.), producing a weak contrast between earthen architecture remains and the substratum or the surrounding archaeological layers.
The aim of this paper is to illustrate these results using case studies from arid, temperate and Mediterranean environment.

09 CHARACTERIZATION OF EARTHEN BUILDING MATERIALS AND TECHNIQUES IN ARID CONTEXTS: CASE STUDIES FROM SOUTH-EASTERN ARABIA

Author: Dr Azzarà, Valentina - UMR 7041 - ArScAn - VEPMO (Presenting author)
Keywords: Mud-bricks, Rammed earth
Presentation Preference: Oral

Characterization of building techniques related to earthen architectures, based on macroscopic observation, is often less problematic in arid contexts, compared to more temperate regions. Nevertheless, the nature of the sediments and the recipes adopted during the production process can hinder the identification of building techniques and theirs specificities; in some cases, even the simple detection of such structures on the field requires time-consuming strategies and methods of excavation.

The Early Bronze Age sites of Ra's al-Hadd HD-6 (ca. 3100-2600 BCE) and Ra's al-Jinz RJ-2 (ca. 2500-2000 BCE), located in coastal Oman, at the easternmost tip of the Arabian Peninsula, present a series of earthen architectures related to different phases of occupation. Both settlements show intrasite modification of building techniques and/or materials, detected on the field and through the analysis of samples of building materials: transformations concern essentially the fabric of mud-bricks or the passage from mud-bricks to rammed earth, but minor changes, such as different types of floors, have been noticed as well.

The evidence allows highlighting how the variation of manufacturing processes has a significant impact on the way the remains can be identified and interpreted during the archaeological field works, depending not only on the degree of preservation of the vestiges, but also on the nature of the enclosing sediments.

10 THE TAPHONOMY OF MINOAN MUDBRICKS

Author: (current PhD. Student) Lorenzon, Marta - University of Edinburgh (Presenting author)
Keywords: mudbrick, geoarchaeology, ethnoarchaeology
Presentation Preference: Oral

Earthen architecture in the Aegean greatly suffered from taphonomic bias, but the adoption of geoarchaeological techniques makes possible to detect and study mudbrick and an integral part of material culture.
This paper presents a multidisciplinary study of earthen architecture in Bronze Age Crete focusing on the topic of raw source material procurement, technological development, and craft specialisation. Macroscopic and microscopic observations constitute the pertinent data to assess variation in earthen architecture in Minoan Crete.
Through the combination of multidisciplinary datasets (geoarchaeological, ethnoarchaeological and architectural data), this investigation sheds light on earthen building material techniques and practices. The geoarchaeological approach based on geochemical analysis and thin-section petrography indicates the presence of a specialised workforce behind the earthen construction chaîne opératoire and shows specific pattern of labour organization and development. The research further focuses on understanding the reasons of specific variation in construction techniques and manufacturing practices over time.
This paper highlights that changes in raw source materials, construction and manufacturing practices are largely determined by changes in the socio-economical structure of Bronze Age Crete. Results will focus on the comparison between different sites and offer fresh insight in diachronic and synchronic terms regarding earthen architecture and craft specialisation.

11 LOAD-BEARING TURF OR SOD WALLS IN THE NORTHERN NETHERLANDS, 400-1300 AD

Author: M.A Postma, Daniël - Archaeo Build / University of Groningen (Presenting author)
Keywords: Turf Longhouses Netherlands
Presentation Preference: Oral

Excavations in the northern coastal region of the Netherlands have proven the past existence of substantial farm buildings with thick walls made of turves (clay or peat 'sods'). The height of type of house construction was from c. 400-800 AD in the clay-rich salt marsh area and c. 800-1300 AD further inland in the (clay-on-)peat areas. Although ground

plans turf-walled buildings have been excavated since 1940, these weren't studied in detail. In general, archaeologists assumed that the choice for building with turves or sods was merely an adjustment to a regional, largely treeless landscape.
Although this common assumption is to some extent correct, it does not exclude that a high quality of construction was achieved. On the contrary: recent typological and technical analyses have shown that the 0.8-1.5 m thick earthen walls supported the weight of the timber roof structure. This paper will present the various arguments for this structural interpretation. In order to work out how such a high quality of turf construction was achieved, two experimental turf-walled buildings were reconstructed since 2012. This helped to clarify the effects of different types of turf and the bonding systems that were used.

12 THE EARTHEN ARCHITECTURE AT NEOLITHIC DIKILI TASH (GREECE): TWENTY YEARS OF RESEARCH ON BUILDING TECHNIQUES

Author: Ms Prevost-Dermarkar, Sandra - Protohistoire égéenne - UMR 7041- Archéologies et Sciences de l'Antiquité (Presenting author)
Co-Author: Ms Germain-Vallée, Cécile - Service archéologique départemental du Calvados; Chercheuse associée au laboratoire LETG-GEOPHEN UMR 6554 UCN
Keywords: Neolithic, Earthen architecture
Presentation Preference: Oral

This paper proposes to summarize the results of the architectural studies developed on the prehistoric tell of Dikili Tash (eastern Macedonia, Greece) since the 1990s. Earthen building remains, which are rather well preserved on this site, have been treated with special attention during the last two excavation programs (1986-2000 and 2008-2017). The aim was to reveal the overall technical process of house building and, through it, to approach the economic and social life of Neolithic villages. In order to identify the gestures and work-chains used for the building of houses and their interior fittings, we developed a protocol of morpho-technological study, which we applied to all recovered daub fragments. This study was accompanied by targeted physicochemical, geomorphological, archaeobotanical and micromorphological analyses, as well as by experimental and ethnographic observations. The combination of those different approaches allowed us to validate some hypotheses about the interpretation of the fragments and to develop several referential systems. Thus it has been possible to describe different daub compositions, preparation and application methods as well as modes of surface finishing. Furthermore, we have been able to reconstruct some techniques used for the building of walls and of interior fittings such as floors, platforms, ovens, hearths and storage bins. The study carried out on two different sectors belonging to two phases of the Late Neolithic period (5500-4200 BC) allows highlighting similarities as well as changes in the techniques employed on this site.

13 THE EARLY NEOLITHIC WATTLE AND DAUB STRUCTURE OF LUGO DI ROMAGNA, FORNACE GATTELLI (NORTH EAST ITALY)

Author: PhD Tasca, Giovanni - Museo Civico di San Vito al Tagliamento (Presenting author)
Co-Author: Dr Steffè, Giuliana - Soprintendenza Archeologia, Bologna - Italy; Dr Degasperi, Nicola - Cora Ricerca Archeologica s.r.l. - Trento, Italy
Keywords: Wattle and daub
Presentation Preference: Oral

In the village of the Early Neolithic of Lugo di Romagna, Fornace Gattelli (North East Italy) have been found and excavated (1983-2001) by the State Archaeological Heritage Service (Soprintendenza Archeologia, Bologna - Italy) the exceptionally well preserved remains of a wattle and daub house. Inside it, have been found two ovens and a hearth, and traces of an interior division in two rooms. House walls were obtained by a timber frame with an inhomogeneous plot, covered with silty clay mixture, collapsed and partially burnt by the fire which destroyed the structure. Only a part of the daub of the walls is sintered in a permanent way, while mostly it remained at an inconsistent stage reddened by the heat; incoherent mass was weighed on the excavation and withdrawn in part, hardened daub fragments were systematically located on the map and picked up, and afterwards fully weighed and examined. The refitting of data obtained with the study of all daub fragments (daub thickness; position and aspect of surfaces; dimensions, form and relations of timber imprints) and the comparison of these data with the house plan features found under the amount of walls debris has permitted to reconstruct building techniques, collapse dynamics and some postdepositional events.
The amount of hardened daub is about 3% of the incoherent mass of reddened earth, according to the hypothesis of an accidental fire as the event which destroyed the house. This paper's aim is to present the main results of the systematic analytic study of daub remains from Lugo di Romagna, Fornace Gattelli, that has now been completed.

14 FOLLOWING WATER MANAGEMENT IN FIRST NEOLITHIC VILLAGES FROM THE MIDDLE EAST: A VIEW FROM TELL HALULA

Author: Prof. Miquel, Molist - Universitat Autònoma de Barcelona
Co-Author: Dr. Gomez Bach, Anna - Autonomous University of Barcelona (Presenting author)
Keywords: Neolithic, Earthern architecture,
Presentation Preference: Oral

This paper focuses on difficulties to identify and interpret mud- structures related to water management in Neolithic settlements (mudbricks, plasters floors ...). Tell Halula (Euphrates Valley, Syria) as a case of study will be deeply analyzed (period average PPNB c. 7500 BC. Particularly the field work excavations developed on 2011 let us to detect populated areas rejection of wastewater and offered several samples to be studied. The approach interaction between water, built spaces and corridors in domestic areas become essential to understand water strategies from these communities and their mud-brick architecture.
Complementarily, building structures such as wells, pipes or water deposits, will be presented with the aim to validate the interpretation thought new methodologies (micromorphology, DRX...).

15 ARCHITECTURE AS A PROCESS OF CONTINUITY AND CHANGE: LATE NEOLITHIC BUILDING STRATEGIES AND TECHNIQUES AT ÇATALHÖYÜK

Author: Baranski, Marek Zbigniew - Academy of Fine Arts in Gdansk; Gdansk University of Technology (Presenting author)
Keywords: Çatalhöyük, Neolithic, architecture
Presentation Preference: Oral

Neolithic site of Çatalhöyük in central Anatolia is seminal for our understanding of the development of Neolithic lifeways. One of the most striking aspects of its archaeology are clusters and columns of houses, where house after house were built upon each other in continuous, uninterrupted sequences. As a result, Çatalhöyük architecture has been a subject to intense and international debate. However, this discourse has focused on the classic period, while overlooking the late Neolithic phases of occupation. This paper concerns the architectural and structural issues connected with the construction, maintenance and abandonment of buildings within the Team Poznan (TP) and Gdansk (GDN) Areas which were situated close to the peak of Çatalhöyük East Mound. TP and GDN architecture represents the late phases of the Neolithic settlement and is dated between about

6,400 – 5,950 cal. BC. It was studied for building techniques and materials, with a particular focus on building foundations, brick bonds, source and composition of mudbricks as well as a flat roof support structure. The comprehensive architectural, geoarchaeological and stratigraphic analysis has enabled a better chronological understanding and casts new light not only on sense of architecture and space but also social organization at the end of this outstanding settlement.

16 SPREAD AND INDEPENDENT TECHNICAL INVENTION OF THE COB AND MOULDED MUD BRICK IN THE SOUTH CAUCASUS DURING THE SIXTH MILLENNIUM?

Author: PhD BAUDOUIN, Emmanuel - Paris-Sorbonne University (Presenting author)
Keywords: caucasus, shulaveri-shomu, neolithic
Presentation Preference: Oral

Relationships between Mesopotamia and the South Caucasus were established mainly during the 1960's, especially with the discovery of Mesopotamian ceramics at the site of Kültepe, in Nakhichevan, but the nature of the relationships were not clearly defined. Since the 1990's, research in the South Caucasus has intensified. International archaeological teams have focused in this region in order to understand the neolithisation process on the fringe of the Near East.
Despite a lengthy history of architectural researches in Near Eastern studies, works on earthen material are recent. Following the further work begun in 1980's and 1990's by O. Aurenche and M. Sauvage in the Near East and thanks to methodological work performed in the South of France over the past thirty years, an outdated terminology can be revised to define architectural techniques. A precise evolution of earthen material in the South Caucasus can be proposed by a review of stratigraphic contexts, bibliographical data and new discoveries in the region. This communication will focus on the cob and moulded mud brick, two techniques testifying different evolving paths.
The spread of the cob can be assumed across Northern Mesopotamia (Hassuna and Halaf cultures) since the second half of the seventh millennium, and then towards Eastern Anatolia (Hajji Firuz culture) and the South Caucasus (Aratashen and Shulaveri-Shomu cultures) during the sixth millennium. Simultaneously appeared the moulded plano-convex mud brick in the Shulaveri-Shomu culture (Aruchlo, Mentesh Tepe) at the beginning of the sixth millennium. But unlike the cob, the moulded plano-convex mud brick seems to appear as a local and independent innovation in the Kura Valley, according to a pattern well known during the PPNB period in the Near East.
Data submitted are the results of a PhD work on know-how architectural exchanges between the South Caucasus and Mesopotamia during the sixth and fifth millennium.

17 EARTHEN ARCHITECTURE AND THE EARLY NEOLITHIC HOUSES OF THE IBERIAN PENINSULA: CURRENT ADVANCES AND FUTURE PERSPECTIVES

Author: Gómez, Magdalena - IPHES (Presenting author)
Keywords: Neolithic, houses, earth
Presentation Preference: Oral

The use of earth as building material in the Early Neolithic of the Iberian Peninsula has been observed in open-air sites since the 1990s of the XXth century. Despite this long tradition, we still lack standardized protocols for its recognition and registration in the archeological record, subsequent laboratory analysis and further preservation strategies for this type of archaeological material.
In this contribution, we focus on macroscopic analysis of daub fragments collections from Early Neolithic open-air sites of the Eastern sector of the Iberian Peninsula, to identify some aspects of earth architecture and building techniques. Results exhibit certain degree of variability that will be explored and analyzed.
We have identified different building techniques during the Early Neolithic period such as the use of wattle and daub technique, cob and rammed earth. Even if the local environment and the availability of raw material may influence the choice of one technique over another, is it possible to interpret this variability in terms of different cultural traditions? Systematic analysis of daub fragments can reveal substantial information to reconstruct domestic spaces at Early Neolithic open-air sites. The reconstruction of houses and domestic areas, allow us to address other key questions concerning the first farming communities of the Iberian Peninsula as their demographic contingent, the investment on domestic spaces, or the reproduction of architectural traditions.
Ultimately, despite difficulties on detection and interpretation of earthen architecture, our contribution highlights the great potential of this archaeological material to improve our knowledge of the earliest farming village life in the Iberian Peninsula. Future advances will profit from the systematic application of multidisciplinary and multiscalar approaches, combing micromorphological and macroscopic analysis to provide relevant results for reconstructing habitat structures of Early Neolithic open-air sites and address socioeconomic key aspects of first farming communities in the context of long-term evolutionary interpretations.

18 EARTHEN ARCHITECTURE IN THE IRON AGE IN TEMPERATE FRANCE: THE EXAMPLE OF THE SOUTH-WEST

Author: PhD Student Pierre, Péfau - University Toulouse Jean Jaurès (Presenting author)
Keywords: France, Daub, Cob
Presentation Preference: Oral

The frequent discoveries of postholes, drawing plans of buildings on Iron Age settlements and the difficulty highlighting earthen architectures (cob, mudbrick), so well-known in Mediterranean context, make it logically of the earthfast post architecture the quintessential technique of construction in temperate France. The uncover of daub fragments with wattle impressions on these same sites generally leads to the automatic restoration of infill of this type for earthfast post constructions. However, an increasingly regular study of daub fragments and the multiplication of excavations of stratified sites, which are more likely to reveal the diversity of the architectural spectrum, provide a nuance within this model. The existence of numerous infill techniques and earthen architectures can often be suspected and sometimes even shown.

The example of the South-West is, on this basis, particularly evocative, since it combines all the parameters needed to demonstrate the architectural diversity in the Iron Age, concerning timber framing, floors, infill techniques and wattle morphologies, as well as plasters. Nevertheless its location as a crossroad between Spain and Mediterranean littoral does not turn it into an exception in the architectural scene of temperate France; the architecture of the south-west finds comparisons in northern France too. Therefore, the study of southwestern architecture within its temperate context thus makes it possible to highlight the importance of the methods of investigation and the complexity of architecture in the Iron Age, despite apparently homogeneous remains on the ground.

19 APPLICATION OF MICROMORPHOLOGY TO THE STUDY OF EARTHEN ARCHITECTURES IN PREHISTORIC CONTEXTS FROM THE NORTHEAST OF THE IBERIAN PENINSULA.

Author: Dr Mateu, Marta - Universitat de Barcelona; GRAP and SERP (Presenting author)
Keywords: unbaked-earth, micromorphology, building
Presentation Preference: Oral

We present a methodological proposal to study the earth elements that compose the earthen structures in prehistoric contexts. The manufactured unbaked earth elements (construction and furniture elements) are composed of detrital sediment and vegetal components. In the NE region of the Iberian Peninsula, this material appears in prehistoric contexts, such as from Neolithic to the Early Iron Age. This type of elements, that has usually received little interest by researchers, has been the main object of our study.

This material, with some very special characteristics and problems, is currently in study process (Garcia i Rubert et al. 2016, Mateu et al. 2013) and it has been the main goal of our PhD (Mateu 2016), focused on the analysis of a large sample set from the Early Iron Age archaeological site of Sant Jaume (Alcanar, Tarragona, Spain).

In this presentation, we introduce our methodology, which involves the application of different approaches: typological classification, morpho-sedimentary description and micromorphological analysis. All this in order to get more information about these elements that will provide to archaeologists a method for a better identification of these structures on the field, the characterization of construction techniques and the nature of their sediments. To illustrate this methodology we present some cases studies from NE region of the Iberian Peninsula from Neolithic to the Early Iron Age. We study different elements of these earthen structures (wattle and daub, cob, floors, plasters, fireplace, some mudbricks, etc.) from various archaeological sites like Sant Jaume or Can Sadurní (Begues, Barcelona, Spain) (Blasco et al. 2011) among others.

With the presentation to the case studies and our methodology, we want to improve the study of these elements and their interpretation in any archaeological site, and therefore, to have a better knowledge of earthen architectures from the Neolithic to the Iron Age.

20 EARTHEN ARCHITECTURE EXAMINATION FROM THE NEOLITHIC TO THE IRON AGE IN THE SOUTHERN CAUCASUS

Author: Dr Gasparyan, Boris - Department of Early Archaeology, Institute of Archaeology and Ethnography of National Academy of Science, Republic of Armenia
Co-Author: Ms Iovino, Maria Rosa - Istituto Italiano di Paleontologia Umana - Rome, Italy (Presenting author); Dr Petrosyan, Arthur - Department of Early Archaeology, Institute of Archaeology and Ethnography of National Academy of Science, Republic of Armenia; Dr Dan, Roberto - ISMEO , Rome, Italy; Ms Vitolo, Priscilla - ISMEO , Rome, Italy
Keywords: Southern-Caucasus, resilience, building-strategies
Presentation Preference: Oral

The Southern Caucasus, what is the territory of nowadays Republics of Armenia, Georgia and Azerbaijan by geographical means includes the southern flanks of the Greater Caucasus Mountains, the system of Lesser Caucasus Mountains, the intra-Caucasus or KuraDepression, and the Araxes River valley.
Aratashen – Shulaveri – Shomutepe cultural tradition (c. 6200 - 5200 cal. BC) spread in the Kura and Araxes River valleys, is characterised by a chaotic group of building structures. At the Kura basin the dwellings are built of plano-convex mud bricks. On the Ararat plain, the use of bricks and/or clay blocks was rarely found at Aratashen (Layers IIb–IId) and Aknashen (Horizon IV). Here and in Kültepe-I, the predominant building material was cob, plastic earth with organic remains such as threshed cultivated cereals and wild desert madwort (Alyssum desertorum).
During the Chalcolithic period mudbrick building tradition continues with different design of architectural shapes (rectangular, rounded, mixed). The traditions of the previous phase continued during the Early Bronze Age . During the Middle Bronze Age, traditions were fragmented by the crisis of the Kura-Araxes culture. Nomadic lifestyles dominate and generated a paucity of settlements, the birth of a series of local kingdoms , the merging of millennial local cultural traditions with the typical administrative system installed from Mesopotamia. These changes are visible also in Architecture.
The best example of this new architectural tradition is represented by the site of Karmir-Blur (Armenia), built on a huge mud-brick terrace, a dimensional scale extraordinary for the region. This interdisciplinary re-analysis will be also addressed to the elucidation of mud-bricks manufacture and building strategies and to the search of evidence of earthen architecture damage and repair, to design past human and materials resilience to problems connected with the geo-morphological and environmental characteristics of living chosen contexts.

21 MUD BRICKS AND "CONCOTTI" FROM NURAGIC SETTLEMENT OF PALMAVERA (ALGHERO, SARDINIA). PRELIMINARY ARCHAEOMETRIC RESULTS.

Author: Pais, Marta - Università degli Studi di Sassari (Presenting author)
Keywords: hut, mudbricks, archaeometry
Presentation Preference: Poster

The aim is to present the preliminary results of the archaeometric analysis of non-vascular clay materials been found in the Nuragic village of Palmavera (Alghero, Sassari), north-western Sardinia (Italy). This site is marked by the presence of a complex nuraghe surrounded by an extended village of circular huts, inhabited from the middle Bronze Age to the early Iron Age. The Hut 42, explored during the excavation carried out in 2013 e 2014, revealed a stratified deposit rich of mud bricks, associated with fragments of "concotti".
The archaeometric analyses carried out on these artefacts (POM, XRD, XRF, DTA, TGA) have determined their chemical and mineralogical-petrographical features together with their potential exposure at high temperatures. These data, mixed with the identification of superficial traces on the artifacts and the observation of the related ethnographic traditions, can give a better understanding of the technological and production processes involved in their creation. Besides, it could make possible to determine with less uncertainty the real purpose of these items inside the huts.
In the context of Sardinian sites, artefacts made with crude earth and mud bricks are actually identified in about twenty villages, geographically concentrated in south-western Sardinia where the tradition of mud bricks in building is alive and deeply rooted, even nowadays.
Moreover, this dataset provides potential evidence about raw materials and construction techniques used in the settlements during the Nuragic age.

22 THE PREHISTORIC VILLAGE OF CASE BASTIONE, VILLAROSA, ENNA (ITALY): DAUB AND DOMESTIC ARCHITECTURE IN CENTRAL SICILY

Author: Miss Speciale, Claudia - Università del Salento (Presenting author)
Co-Author: Mr Giannitrapani, Enrico - Coop. Arkeos; Mr Iannì, Filippo - Coop. Arkeos
Keywords: Prehistory, Sicily, Daub
Presentation Preference: Poster

The settlement of Case Bastione is located in the North-Western area of Enna, Villarosa, along the eastern side of Morello river (Giannitrapani et alii 2014). The large settlement (more than 2 ha) lies at the foot of a rocky ridge delimiting Stelo Lake and it is placed on a terrace that looks over the Ferrari dam, built in the 60s on the Morello River. Since 2007, there have been six excavation field campaigns by Cooperativa Arkeos: during these investigations, it was possible to verify how the occupation of the area started at the end of the Neolithic and developed continuously throughout the Copper age until the advanced phases of Early Bronze Age. The stratigraphic investigations so far regarded the latest phases of the prehistoric settlement. In many areas of the excavation, several hut structures of the facies Castelluccio were found. According to the absolute radiocarbon datings and pottery typological analysis, they date to mid 3rd-beginning of 2nd mill. B.C.
Daub – used here as coating layer of the perimeter walls – was identified in several areas of the excavation. Its detection and recording was not always of simple observation, even if preservation conditions are quite good, probably due to the chemical-physical properties of the soils and intense fire they were exposed to. Hut 1 of Case Bastione (EBA) has 2 different phases of use and its destruction was probably due to a fire that allowed to preserve the daub. A first analysis of mixtures and prints (Speciale 2015) let us outline some issues on the architectural techniques and hypothize the features of the elevation, also thanks to comparisons with other huts of the same period in Sicily. The study of new data from Hut 5 (LCA), still ongoing, will give new perspectives on the architectural techniques.

23 RETURN ON EXPERIENCE : IDENTIFICATION OF EARTHEN STRUCTURES OF THE NEOLITHIC SITES OF THE HILL SAINT-CHARLES IN MARSEILLE (FRANCE).

Author: Dr Sénépart, Ingrid - DAVDM-UMR-CNRS 5608 TRACES (Presenting author)
Co-Author: Dr Wattez, Julia - INRAP - National Institute for Preventive Archaeological Research
Keywords: neolithic, cob, methodology
Presentation Preference: Poster

The neolithic sites of Nédelec and Bernard-du-Bois (VIth-IVth. BC) of the the hill Saint-Charles in Marseille (France) was the object of preventive surveys in 2005 and 2008, led in collaboration by Inrap and the « Division Archéologie » of the city of Marseille. On this occasion, the excavation of every site revealed the presence of earthern architecture and structures under various forms (wall and constructed floors). Their discovery in a context of stratified site raises the question of the means for their identification during the preventive survey but also then during the exploitation of the excavation data

The results can be compared with other discoveries made this last years in similar contexts in the Southeast of France and in the western Mediterranean Sea.

397 MAKING CHOICES

Theme: 2. The Valletta Convention: the next 25 years
Author: Marik, Jan (Czech Republic) - Institute of Archaeology of the CAS, Prague, v.v.i.
Co-Author(s): Sloane, Barney (United Kingdom) - Historic England
Keywords: heritage management, decision-making, Valletta Convention
Presentation Preference: Session with papers of six minutes and six slides

The 15th annual symposium (2014) of the European Archaeological Council (EAC) resulted in a new strategic agenda, the Amersfoort Agenda, aimed at 'setting the agenda for the future of archaeological heritage management in Europe and better embedding archaeology in society: moving from "Valetta to Faro". One of the key themes of the agenda is the issue of making decisions in the context of archaeological heritage management and development-led archaeology. New working group of EAC on the theme of 'Informed, transparent and participative archaeological heritage management called "Making Choices" was set up in 2016. The working group aims to produce insights, tools and procedures that can help us make choices and constitute a guideline/best practice for evidence-based decision-making within the context of archaeological heritage management. The first action of the working group is mapping of the different approaches to dealing with choices in the archaeological heritage process. Results of this mapping based on questionnaire distributed among the EAC members will be presented and discussed within the session. We would like to invite archaeologist interested in archaeological heritage management and encourage them to discuss this issue.

01 MAKING CHOICES IN EUROPEAN DEVELOPMENT-LED ARCHAEOLOGY - TOWARDS AN UNDERSTANDING OF DECISION FRAMEWORKS

Author: Mr Sloane, Barney - HE - Historic England; European Archaeological Council (Presenting author)
Keywords: Valletta, choices, management
Presentation Preference: Oral

Whether or not member states have ratified Valletta or Faro, whether commercial archaeology is widespread or non-existent, all archaeological heritage managers make choices about development-led archaeology daily. These might include: preserve or excavate; how, and how much, to investigate; what to archive; what and where to publish; how (far) to involve the public. The money required for such excavations, whether funded by the state, by the developer/investor, or by a mixture of the two, is constantly (and increasingly) scrutinised. It is becoming vital to demonstrate 'proportionality', 'value for money' or 'reasonable' approaches to the cost of archaeology. This means transparency in decision-making.

A survey conducted by EAC (Dec 16 - Feb 17) has revealed some very interesting information about the criteria used to inform decisions across Europe. This presentation will briefly summarise the key findings and indicate where further work may be anticipated in developing a more formal support framework for making choices. The survey forms one action arising from the EAC's Amersfoort Agenda (see http://old.european-archaeological-council.org/files/amersfoort_agenda_english.pdf)

02 MAKING CHOICES FOR ARCHAEOLOGICAL ARCHIVES IN EUROPE

Author: Mr Brown, Duncan - HE - Historic England; Archaeological Archives in Europe
Co-Author: Dr Bibby, David - EAC Working Group for Archaeological Archives (Presenting author)
Keywords: Archive Selection Choices
Presentation Preference: Oral

In recent years it has become clear that, as elsewhere in the archaeological process, we must be more selective about what parts of the recovered archaeological record we should curate in perpetuity. Selection, and the development of a selection strategy, has therefore become a recognized task in archaeological projects. The EAC Working Group for Archaeological Archives set out an approach to selection in 2014, with the ARCHES project (A Standard and Guide to Best Practice for Archaeological Archiving in Europe; EAC Guidelines 1). This paper will show how the Group has been working on the issue of selection since then, with particular reference to the concept of 'Making Choices.' Preliminary work by the EAC WG can now show that this issue is shared across Europe, while none of us has found a single answer to a growing problem. None of the proposed solutions will work until we are certain about how we should go through the process of selecting archive materials that we know are worthy of preservation. This applies as much to the documentary archive, including its digital forms, as it does to archaeological materials, and it must be planned at the beginning of every archaeological project. There are choices to be made that, beyond the production of archaeological archives, include how to support the curation of archaeology collections and how to provide suitable, sustainable storage. These are problems with significant social and cultural implications, that we all have in common, and that require serious discussion now, on the international stage.

03 MAKING CHOICES ABOUT THE ARCHAEOLOGICAL HERITAGE FOR THE FUTURE

Author: Dr Skyllberg, Eva - Swedish National Heritage Board (Presenting author)
Keywords: Making Choices
Presentation Preference: Oral

What are the consequences of choices made in archaeological heritage management? Every decision concerning an archaeological site, about what to be excavated or what to be preserved, is affecting the archaeological heritage as whole. This is especially visible in suburbs and outskirts of large cities where archaeological sites, step by step, are being removed to give place for buildings and infrastructure. In the long run the possibility to understand the history of the landscape is vanishing. For the citizens the distance to the nearest archaeological site is constantly increasing.

04 KNOWLEDGE FOR INFORMED CHOICES

Author: Dr Lauwerier, Roel C.G.M. - Cultural Heritage Agency of The Netherlands (Presenting author)
Keywords: heritage-management, decision-making, tools
Presentation Preference: Oral

Choices are inevitable in archaeological heritage management. There is nothing wrong with this, provided they are made in a well-informed, transparent and participative way. With the aim of providing 'knowledge for informed choices', a series of tools have been developed for archaeological heritage management in the Netherlands. They include digital maps, datasets, methods, guidelines, best practice and web-based applications to facilitate the effective, efficient and transparent selection of valuable archaeological remains. The tools relate to archaeological predictions, disturbances by agriculture and other activities, archaeological heritage maps, prospection methods, research questions, and scientific syntheses to close the archaeological heritage management cycle.
The tools were developed as part of the Cultural Heritage Agency's 'Archaeology Knowledge Kit' programme, in response to an evaluation of archaeology legislation that entered into force in the Netherlands in 2007, implementing the Valletta Convention. While the care of archaeological heritage is primarily the responsibility of local authorities in the Netherlands, it was clear that there was much to be gained by developing tools for these authorities and the agencies working on their behalf.
We like to present and discuss the goals of the programme and its constituent projects, the products they have yielded and the intended users, in the context of the legislation and the structure of archaeological heritage management in the Netherlands.

05 TOOLS FOR VALIDATION OF ARCHAEOLOGICAL INVESTIGATIONS

Author: Special Advisor, Archaeologist Roland, Thomas - Agency for Culture & Palaces, Denmark (Presenting author)
Keywords: Prioritising, National strategies
Presentation Preference: Oral

The archaeological heritage in Denmark is protected by the Museum Act of 2001 inspired by the Malta Convention, which is ratified by Denmark. Danish Agency for Culture is the central authority on archaeological matters and 27 museums with archaeological responsibilities have been given the authority to carry out the archaeological excavations – and the responsibility for keeping and protecting the find material.
About 900 trial archaeological investigations are carried out each year, mostly in connection with construction works and therefor funded by developers. This implies an important question about how we can assure that developers money is only spend on significant objects that will supply us with new/important information? To help us prioritising in Denmark a set of national strategies for the archaeology is drawn up trying to ensure a national standard and the providing of new knowledge.
The paper will focus on the validation of the archaeological work and the questions: How do we choose between excavation and non-excavation among the archaeological sites affected by development?, and how does the archaeological excavation strategies work as tools for identifying and prioritising significant sites?

06 MAKING CHOICES – A MONUMENT BETWEEN PRESERVATION AND RESEAR

Author: Dr Schrettle, Bernhard - ASIST
Co-Author: Dr Steigberger, Eva - Bundesdenkmalamt (Presenting author)
Keywords: Heritage management Austria
Presentation Preference: Oral

The presentation deals with an example of a high ranking archaeological monument. This late Iron Age and Roman sanctuary has been of interest to scientific research for decades. After long years of excavations caused by building projects a combined long-term concept of research interests and requirements of monument protection should provide guidelines for protection practice under the influence of research interests and scientific questions.
Those guidelines will be generalized to be of use in Austria for all high ranking archaeological monuments under protection in order to come to a general, nationwide, comprehensible procedure for those monuments in making choices how to preserve archaeological monuments and how to decide which parts can be destroyed through excavation in order to gain scientific results that help to better comprehend, interpret and preserve the monument.

07 RESEARCH ARISING FROM DEVELOPMENT-LED INTERVENTIONS

Author: Dr O\'Keeffe, John - Department for Communities (Northern Ireland) (Presenting author)
Keywords: development, research, choices
Presentation Preference: Oral

The vast majority of archaeological excavations conducted throughout Northern Ireland are as a result of development and land-use change proposals. Excavation, and the material revealed, is for the most part a by-product of the spatial planning process. As a result of legislative change in respect of specially-protected historic monuments, and the progress in spatial planning policies, a very large portion of the recorded resource of sites and monuments is now left free from development. There is a nuanced approach to urban, peri-urban and rural development, however, which means that there are also nuanced approaches to understanding the material culture unearthed in the course of development-led works. Simple research excavations of known or upstanding monuments is now a very limited activity. Furthermore, the major discoveries of 'new' sites in rural or peri-urban locations (often revealed in large scale developments or infrastructure works) means that the largest corpus of new data, awaiting examination, is from sites that up until 25 years ago were either unknown or very poorly understood. The results of each excavation should, in an ideal world, inform the decisions that lead to each new intervention. How do we step into that 'unknown'?

08 CONSIDERATIONS ON FINANCING OF DEVELOPMENT ARCHAEOLOGY

Author: Ms Kreiter, Eszter - Budavári Ltd
Co-Author: Ms Wollak, Katalin - independent heritage expert (Presenting author)
Keywords: financing, proportionality, choices
Presentation Preference: Oral

The session abstract referred to the questionnaire prepared by the EAC Working Group "Making Choices". Among the 21 questions a small set of questions examined the funding for preventive archaeological excavations, whether all categories of development are treated the same way, or are some kinds of development treated differently. During the evaluations of the answers further questions have been raised referring to the different implementations of the developer pays principle; the existence/non-existence of any state fund, subsidy or compensation; the proportion and variations in the prices of archaeological intervention (in the survey and in the excavation and post excavation phase); the pricing mechanisms – the role of the state agencies; the varieties for special treatment in case in case of scheduled sites, large scale /small private / particular development. The paper will present the similarities, the unique solutions the good practices and the decision-making branches of the answering countries.

Katalin Wollák – Eszter Kreiter

09 RESEARCH DESIGN AND RESEARCH FRAMEWORKS IN DEVELOPMENT-LED ARCHAEOLOGY.

Author: PhD Marik, Jan - AU - Institute of Archaeology of the Academy of Sciences of the Czech Republic (Presenting author)
Keywords: development-led archaeology, research-design
Presentation Preference: Oral

Written research designs or national frameworks are mostly understood as effective tools for quality control of scientific, research questions, objectives, and applied methods in development-led archaeology. The preliminary results of the EAC Making Choices Working Group survey have shown that one third of the countries have not any system of written research designs or research frameworks on the regional or national level. Control of quality of the research in these countries is usually based on review of results or monitoring on sites. Czech Republic can be used as an example of a country without any regulations regarding the archaeological fieldwork. There, the discussion on obligatory research design or national research framework just started in the course of preparation of new legislation. This paper will point on positive and negative aspects of using research regulation in comparison to the relative freedom of decision making given to an archaeologist.

398 ON THE MARGINS? THINKING THROUGH MARGINALITY IN THE HOLOCENE MEDITERRANEAN

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Vandam, Ralf (Belgium) - University of Leuven
Co-Author(s): Tomkins, Peter (Greece) - American School of Classical Studies at Athens
Keywords: Marginality, Mediterranean, Human-environment interactions, Comparative-approach
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

While the ecological diversity of the Mediterranean region provided multiple dwelling possibilities for past human groups, we have not investigated these with equal efficacy. For

the Holocene research has focused on complex, multi-period sites in zones where agricultural output is higher and more predictable. Such sites attract us because of their large size, high visibility and tendency to exhibit higher-end social complexity (e.g. population density, monumental architecture, markets, etc.). In contrast, much less is known about zones where agriculture was less productive or possible (e.g. highlands, deserts, wetlands, coasts). Typically research has glossed such landscapes as 'marginal', usually without thinking more deeply about what marginality might mean or gathering adequate data to establish how people actually lived. Consequently, we know little about how such groups subsisted and connected; how they related to others; how they were integrated within larger political-economic systems; and how this varied in timespace.

This session will bring a critical, comparative, empirical perspective to the question of marginality using case studies from the Mediterranean past. What do we really know about how 'marginal' groups lived? Why, and in relation to what, are they considered marginal? If marginality lies at the end of an axis of variation, what defines that axis (e.g. distance, productive output, access to resources etc.). If multiple definitions are possible, do they conflict? Are our definitions of marginality still heuristically useful? Would they have been recognizable to the people of the past and, if not, is this a problem? What alternatives might be preferable?

01 ON THE MARGINS? THINKING THROUGH MARGINALITY IN THE HOLOCENE MEDITERRANEAN

Author: Vandam, Ralf - University of Leuven
Co-Author: Tomkins, Peter - American School of Classical Studies at Athens (Presenting author)
Keywords: Marginality Mediterranean
Presentation Preference: Oral

In this introduction paper we will raise key questions and issues that we want to address in this session.

While the ecological diversity of the Mediterranean region provided multiple dwelling possibilities for past human groups, we have not investigated these with equal efficacy. For the Holocene research has tended to focus on complex, multi-period sites in zones where agricultural output is higher and more predictable. Such sites attract us because of their large size, high visibility and tendency to exhibit higher-end social complexity (e.g. population density, monumental architecture, markets, etc.). In contrast, much less is known about zones where agriculture was less productive or possible (e.g. highlands, deserts, wetlands, coasts). Typically research has glossed such landscapes as 'marginal', usually without thinking more deeply about what marginality might mean or gathering adequate data to establish how people actually lived. Consequently, we know little about how such groups subsisted and connected; how they related to others; how they were integrated within larger political-economic systems; and how this varied in timespace.

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02 THE 20TH CENTURY INVENTION OF ANCIENT MOUNTAINS

Author: Dr. Robb, John - Cambridge University (Presenting author)
Keywords: mountains, tradition, chronogeography
Presentation Preference: Oral

Highland societies are often considered to be refuges where change happens slower than in the well-connected lowlands and ancient traditions remain untouched. Yet this has rarely been scrutinised. This paper looks at the mountains of Aspromonte, Calabria (Italy). Here a dominant discourse, traceable in literature and travellers' accounts for several centuries, has seen Calabria's mountains as populated by sturdy peasants, shepherds embodying timeless traditions of pastoralism, and atavistic brigand societies. Yet archaeological survey of Aspromonte reveals very little truth in this image. While the mountains were frequented for particular purposes in all periods from prehistory to the present, there is little evidence for either brigand societies or specialised pastoralism. Instead, the systematic occupation of mountains above 1400 m really began only in the 20th century as a state-sponsored project mixing political control, economic exploitation, and development of a recreational landscape for urban audiences. Yet as soon as the mountains were opened up for development, they were enmeshed in discourses of antiquity and tradition -- which were not historical truth but an integral part of fitting them into a lowland, city-based chronogeography.

03 MARGINS OF SETTLEMENT, MARGINAL REGIONS AND MARGINAL PEOPLE

Author: Professor Dr BINTLIFF, JOHN - Leiden University (Presenting author)
Keywords: hidden-landscapes, marginality, internal-colonisation
Presentation Preference: Oral

This paper will focus initially on archaeological research into marginal landscapes that border agricultural heartlands in the Mediterranean, then shift to consider whole Mediterranean regions that have been considered by historians and archaeologists as marginal for human occupation, finally it will conclude by a consideration of historic people even within settlement heartlands whose material culture and lifestyle has been considered as marginal to civilized society.

04 MARGINALIA- GREAT FOR CONNECTING IDEAS, TRANSLATING JARGON, AND SPURRING CRITICAL THINKING.

Author: Dr Miller, Holly - University of Nottingham (Presenting author)
Keywords: Levant, Neolithic, Steppe
Presentation Preference: Oral

By looking at some societies, landscapes and ideas in the archaeological record as marginal, it suggests we see something as central. But central to what? A recent study from the steppic 'margins' of the Neolithic Southern Levant has shown that pastoral communities from less fertile areas are likely to have been 'central' to many aspects of the incipient Mediterranean village life.

This paper will bring together research from zooarchaeology, isotope analysis and material culture studies to show that Neolithic arid zone communities should not be marginalised in considerations of innovation, development and dissemination of ideas, leading to the suggestion that 'marginal' human experiences are better considered as 'regional' in the archaeological record.

05 INVESTIGATING THE MARGIN: THE ARCHAEOLOGY OF JORDAN'S EASTERN BADLANDS

Author: Professor Akkermans, Peter M.M.G. - Faculty of Archaeology Leiden University (Presenting author)
Keywords: Marginality, badlands, Mediterranean
Presentation Preference: Oral

The arid and desolate, basalt-strewn uplands of North-East Jordan are invariably perceived as the home of highly marginal, pastoralist communities, on the very fringes of the early urban polities of the Eastern Mediterranean. However, current fieldwork in the area reveals many and highly diverse late prehistoric to early historic sites and assemblages (including rock art and inscriptions on stone) that were finely tuned to their harsh environment over time. This paper investigates the desert lifeways and strategies which allowed the local peoples to successfully exploit the 'margins.'

06 IDENTIFYING ACTIVITY IN MARGINAL LANDSCAPES USING NON-MARGINAL SETTLEMENT CORES. LANDSCAPE AND LAND USE RECONSTRUCTION IN THE WESTERN TAURUS MOUNTAINS.

Author: Dr. Kaptijn, Eva - Royal Belgian Institute of Natural Sciences (Presenting author)
Co-Author: Dr. Marinova, Elena - Katholieke Universiteit Leuven; Royal Belgian Institute of Natural Sciences; Dr. De Cupere, Bea - Royal Belgian Institute of Natural Sciences
Keywords: landscape reconstruction, exploitation
Presentation Preference: Oral

Marginality is often a construct of both modern perceptions and research focus. Landscapes that lack large quantities of clearly visible remains from the past and/or cannot easily be regarded as being highly productive in terms of agricultural output are often labelled as marginal areas.
People in the past have used a diverse range of landscape zones, often without leaving many traces visible to us today. One way to identify and understand the use of these 'marginal' regions is through bioarchaeological remains that have been uncovered in the large settlements outside of marginal landscapes. Faunal and archaeobotanical remains (seeds, fruits and wood charcoal) provide information on the various habitats and landscapes used by people in the past.
In this paper, the use of different landscape zones will be investigated for the Sagalassos region in southwestern Turkey. The area is geologically and geomorphologically very diverse and is characterized by great altitude variations. This provides an excellent opportunity to identify the different environmental zones from which excavated botanical remains may have originated and animals were herded. Moreover, three decades of interdisciplinary research within the Sagalassos Archaeological Research Project of the Katholieke Universiteit Leuven has provided us with an enormous amount of archaeological and environmental data. Using GIS the ancient vegetation cover will be modelled for different periods using data from excavated settlements in the Sagalassos region (e.g. Sagalassos and Düzen Tepe).

07 HIGHLANDS AS A MARGINAL ZONE? COMPARING THE BURDUR PLAIN WITH THE DEREKÖY HIGHLANDS IN PISIDIA, SW TURKEY

Author: Vandam, Ralf - University of Leuven (Presenting author)
Co-Author: Willett, Patrick - State University of New York at Buffalo, USA; Poblome, Jeroen - University of Leuven
Keywords: Marginality, Highlands, Anatolia
Presentation Preference: Oral

Previous archaeological surveys in the ancient region of Pisidia mainly focused on the larger fertile intermountain plain areas (e.g. the Burdur Plain). This research revealed numerous farming settlements from the Neolithic (6500 BCE) onwards and highlighted distinct periods of continuity and collapse in human occupation in these areas. Little is known, however, about sites in other landscape zones such as remote, high altitude locations (1400 m asl) which, in contrast to the plain areas, are traditionally considered to be 'marginal' as these were not particularly favorable for permanent habitation. In 2016, the Sagalassos Archaeological Research Project started a new research program of archaeological surveys in the western part of the Taurus Mountains near the villages of Dereköy and Hisar. These new surveys aim to address this knowledge gap by documenting all human activity in these so-called marginal landscapes. In this paper the archaeological, GIS and environmental data from the different landscape zones of ancient Pisidia - highlands and lowlands - will be compared, and examined to what extent the former can truly be considered as marginal.

08 AGAINST ALL ODDS: UNUSUAL TYPE SITES IN INNER WEST ANATOLIA AT 6. MILL. B.C WITHIN KANLITAŞ MOUND AS A CASE

Author: Assoc.Prof. Dr. Türkcan, Ali Umut - Anadolu Üniversitesi (Presenting author)
Keywords: NWAnatolia Kanlıtaş Chalcolithic
Presentation Preference: Oral

The Chalcolithic mounds of generally dated to 6.th Mill B.C and far beyond, around Porsuk River and its tributaries where they are in Western Phyrgia at the edge of a mountainous region of NW Anatolia Region were explored in surveys and excavated site of Orman Fidanlığı site in 1990's by Turan Efe. The defined area between Central Anatolia and Marmara region on which the Neolithic sites tend to diminish or seem to be flat settlements under the thick alluvium. The Porsuk sites of which four sites are known, in contrast to

well known and researched big farming Anatolian Plateau settlements (as Hacılar, Canhasan, West Çatalhöyük, Tepecik-Çiftlik) display unusual character with settlement patterns, architecture, subsistence strategies, craft production as well as exploiting raw materials within probably wide exhange patterns.
Actual excavation work in Kanlıtaş excavations since 2013 focused on the Hill part of the settlement which rests on a big rock with large ovens in front or within the spaces. In many of these spaces, a large collection of marble bracelet and bead pieces have been found along with manufacturing tools that have been already discovered frequently during surveys. Discarded broken marble bracelet (or ring) pieces, noteworthy for their numbers reaching over dozens, also known from Orman Fidanlığı. They show almost all various stages of manufacture ranging from blanks to nearly complete products, with some associated production tools made of harder stones made of magnesite, basalt. The general pattern of raw material exploitation seen in examples (e.g. marble) here supports the hypothesis of utilization of local sources to varying degrees of repeated production and specialized craftsmanship on the site.
The question is whether they make Porsuk Basin 6. mill B.C sites "marginal" with unusual subsistence and crafting strategies to the other well-known big farming settlements of contemporary settlements in Anatolian Plateau.

09 MARGINAL GAINS? THE BREAKING AND MAKING OF COMMUNITIES IN EAST CRETE AT THE TRANSITION TO THE EARLY BRONZE AGE.

Author: Dr Tomkins, Peter - American School of Classical Studies at Athens (Presenting author)
Keywords: settlement, landscape, marginality
Presentation Preference: Oral

During the Neolithic (c.7000-3800 BC) communities in Crete exhibit a clear preference for settlement in locations where conditions for agriculture are optimal and most stable. Proximity to perennially watered areas of alluvial sediment appears to be the overriding concern and, as a result, settlement appears to have been confined to (lowland) locations where these conditions are met. This pattern changes during the transition to the Early Bronze Age (c. 4000-3200 BC), when less productive or predictable – hence 'marginal' – landscapes are settled. Such 'marginal' settlement systems represent a new development in the settlement history of Crete. Although the locations and configurations of sites within such systems are now well-known, thanks to their high archaeological visibility and several decades of archaeological survey, it is much less clear how the inhabitants of these sites subsisted and interacted, why they moved into these new locations in the first place, and how they experienced the social. Various theories have been proposed to explain the 'move to the margins', from a desire to escape an incoming wave of migrants, to social conflict within existing lowland communities. This paper will address these questions by using spatial and ceramic analytical data that shed light on how dispersed groups constructed shared identities; and how they interacted, both with each other and with other communities situated in different (lowland, coastal) locations.

10 CENTRAL OR MARGINAL? SMALL ISLAND NETWORKS OF THE CENTRAL MEDITERRANEAN DURING THE BRONZE AGE

Author: Dr Dawson, Helen - Freie Universität Berlin (Presenting author)
Keywords: Islands, networks, integration
Presentation Preference: Oral

The small islands of the Mediterranean are generally considered to be marginal spaces, lying on the edge of mainstream cultural phenomena occurring on the mainland (according to the "core-periphery-margin" model). While we might acknowledge such marginality in terms of limited resources and productivity, islands can also become critical nodes in networks of interaction, usually thanks to their location along maritime routes, acquiring a certain degree of centrality. This is especially the case during the Bronze Age, when extensive travel across the Mediterranean is first documented. The experience of interaction, which can be heightened given the small size of the islands, results in the formation of "third space" cultures and hybridisations, as communities go through periods of cultural self-definition and remodelling. Drawing on case-studies from the small islands of the central Mediterranean, this paper will discuss how they experienced alternating periods of (relative) centrality and marginality, the possible reasons and effects. This requires taking into account both external and internal factors, large- and small-scale processes. While being part of a network potentially empowered islanders at times, it also exposed them to fluctuations in such networks, so that different strategies were necessary to ensure community survival. This was not always easy for small island communities, who have a tendency to specialise rather than diversify, making them ultimately vulnerable to periodic abandonment and recolonisation, i.e. multiple "cycles of integration".

11 RE-THINKING MARGINALITY AS OPPORTUNITY FOR INTERACTION: AN EXAMPLE FROM THE NORTHERN FRINGES OF THE LATE BRONZE AGE AEGEAN

Author: Prof. Dr. Stockhammer, Philipp - Ludwig-Maximilians-University, Munich; Max Planck Institute for the Science of Human History, Jena, Germany
Co-Author: Assist. Prof. Athanassov, Bogdan - New Bulgarian University, Sofia (Presenting author)
Keywords: interaction, isolation, contact
Presentation Preference: Oral

The research of the Late Bronze Age in the Eastern Mediterranean usually follows the logic of bipolar geometry of centrality and marginality. This is a consequence of the fact that political, social and cultural landscapes of the LBA Aegean and the Levant are perceived as completely dominated by urban and palatial centres. Our approach is inspired by post-colonial discussions on concepts such as contact space and middle ground which point to the dynamic character of centrality: it emerges at places where different cultures, polities, economies and lifeways meet. Therefore, spaces previously labelled as peripheral and marginal can easily shift their roles through time. We do not want to deconstruct the concepts of centrality and marginality, but their stability and bipolar geometry. We assume that a certain space (for example a house) could possess a marginal position in relation to political power, but be central in relation to food or other practices. On a regional and over-regional scale, this means that the study of connectivity and isolation gets new dimensions as it concentrates on practices rather than on spatial zonality. Marginality is polyvalent and relative.

Our work on the Late Bronze Age fortified settlement Bresto located some 80 miles to the north of the Aegean in the valley of the river Mesta / Nestos, is the ground where we try to test and elaborate new approaches on connectivity and marginality. We will present selected examples in order to contrast the traditional perception of marginality as a synonym of isolation and rejection of foreign objects with instances of marginality as contact situations where new phenomena emerge.

12 EARLY MODERN ETHNOGRAPHY AND BRONZE AGE ARCHAEOLOGY OF THE FOOTHILLS AND UPLANDS OF THE RAGANELLO BASIN (NORTHERN CALABRIA, ITALY)

Author: Professor Attema, Peter - Groningen Institute of Archaeology (Presenting author)
Keywords: landscape archaeology, ethnography
Presentation Preference: Oral

The uplands and foothills of the Raganello basin in northern Calabria have been subject of intensive landscape archaeological research for nearly 20 years now by field teams of the Groningen Institute of Archaeology within the framework of the Raganello Archaeological Project. While the project has led to detailed knowledge about the settlement history of the study area from late prehistory to Hellenistic times and of its natural environment, only lately the first steps have been taken to document its rich early modern ethnographic past. Surviving physical remains in the landscape (traditional farmsteads, still cultivated plots, agricultural and pastoral facilities) and direct knowledge (elderly people, local informants, local writings) form a potentially rich source of knowledge on the functioning of a landscape that many would now call 'marginal.' In this paper the potential of the ethnographic past is explored as a means to improve our interpretive framework of the archaeological past as being mapped in the Raganello Archaeological Project.The paper builds on the knowledge and personal friendship of the speaker with the former Mayor of Alessandria del Carretto and speleologist Antonio Larocca. It was his community that was subject of Vittorio de Seta's famous 1959 documentary 'I dimenticati' on everyday life life and feasting in this remote village.

13 RECENT ARCHAEOLOGICAL STUDY IN THE TRANSALPINE CONTEXT OF THE AOSTA VALLEY IN ITALY

Author: Dott. Wicks, David - Akhet srl
Co-Author: Dott.ssa Armirotti, Alessandra - Patrimonio Archeologico. Soprintendenza ai Beni e Attività Culturali della Regione Autonoma Valle d'Aosta (Presenting author)
Keywords: Aosta, Agriculture, EarlyIronAge
Presentation Preference: Oral

Recent archaeological discoveries have cast new light upon the 'marginal' territory of the Aosta Valley, located at the boundaries of SE France, N Italy and Switzerland, where archeological cultures seem to be better-defined in every period of pre-roman study in comparison with this intermediate 'buffer' zone, exemplified in the Early Iron Age, with the region surrounded by the cultures Halstatt, Golasecca and the occupants of the 'Taurini-Salassi area' in NW Piedmont.
A territory with natural advantages for security yet limited agricultural terrain, rich in primary materials yet lacking a source of flint and clays for ceramics, has created circumstances provoking not only the need for indigenous agricultural innovation and research for alternative local materials, but also development of external contacts and exchange systems; a complex situation helped by finding itself at one of Europe's most important cultural crossroads, but made more difficult for the necessity of interacting with more populous cultural groups in constant foment and evolution in the more fertile lowland regions.
Excavations to the north of Augusta Praetoria, supported by bio-archeological studies and radiometric analysis, have revealed a sequence of well-stratified field-systems, testimony to the gradual evolution of a rural landscape from the IV-I millennium BC. A 'model' irrigation system, applicable to other alpine contests, has been hypothesized, illustrating how the Early Iron Age indigenous population not only distributed the all-important water resource but also made fertile previously sterile terrain with artificial deposition of silts.
The discovery of monumental elements (stone circle diameter m 135 and tumulus) imposed upon this rural landscape has led to re-evaluation of the importance of Aosta in the proto-historical period, in addition illustrating the transient nature of power in a 'marginal' context with a momentarily important symbol rapidly losing its cultural significance with a return to the more important work of agricultural production.

14 ROMANS AND "MARGINAL"(?) LIGURES: THE POLCEVERA VALLEY CASE STUDY.

Author: Professor Pasquinucci, Marinella - University of Pisa (Presenting author)
Keywords: Ligures, Romans, Marginality
Presentation Preference: Oral

The Polcevera Valley is located in North-Western Italy between the port city Genoa (Genua in Roman times) and the Apennine passes leading to the Po plain.
Genua became civitas foederata (ally of Rome) possibly in the 3rd cent. BC. It progressively became a relevant Mediterranean port city linking the Mediterranean sea routes with North Italy through the Polcevera Valley, where Ligurian tribes were settled. Literary and epigraphic sources provide data concerning their social and economic structures; small villages or isolated dwellings, "poor" mountain agriculture, cattle breeding on private and public pastureland, forest exploitation.
Ancient writers and archaeological finds both in the Polcevera Valley and in Genua document trade between the "marginal" Ligures and the dynamic Roman port city.
In 148 BC the Roman via Postumia (Genua to Aquileia) was constructed along the Valley eastern slopes. It was a Roman strip of land across a territory belonging to the Ligurian tribe Viturii Langates, but did not affect the local traditional Ligurian economic and social structures.
As documented by the bronze inscription known as Sententia Minuciorum (CIL V, 7749), in 117 BC two Roman arbitri settled a long time dispute between the Genuates (citizens of Genoa, and a Ligurian tribe (Viturii Langates) settled in the Polcevera Valley. The arbiters defined the perimeter of private and communal land and related rules: bridging the gap between Genuates and Viturii?
Despite natural and anthropogenic agents (modern urbanization, steep slopes, vegetation cover, etc.), systematic surveys and archaeological excavations provide significant evidence of the ancient Ligurian settlements in the Upper Valley.
Can we define the Polcevera Valley a marginal area? This paper will discuss various aspects of the data provided by written and archaeological evidence.

15 QUESTIONING MARGINALITY: DISTANCE, LOCALNESS AND AUTONOMY IN UPLAND CALABRIA

Author: Dr. Robb, John - Cambridge University (Presenting author)
Co-Author: Dr Chesson, Meredith - University of Notre Dame; Dr Foxhall, Lin - University of Liverpool; Mr Yoon, David - American Numismatic Society; Dr Lazrus, Paula - St. Johns University
Keywords: mountains, resistance, autonomy
Presentation Preference: Oral

Marginality and centrality are a matter of one's point of view. Economic marginality is often judged by market-oriented society; areas not engaged in large-scale farming to produce a surplus for markets are thought marginal compared to those which are, which are in themselves marginal compared to areas engaged in industry and finance. Political marginality is often judged by connectivity to centres elsewhere, on the modernist assumption that such centres exist and are relevant and that connectivity to them is inevitable and desirable. In the Mediterranean, both of these models work for some periods (such as the Roman period) and not for others (such as the prehistoric, Greek, medieval and

early Modern periods). In this paper, we argue that archaeologists should avoid imposing a priori presentist models of marginality on Mediterranean landscapes. Using data on long-term landscape use in Aspromonte, Southern Calabria, and inspired by theoretical concepts ranging from economics to post-colonial theory, we argue that we should understand Mediterranean landscapes instead as the result of processes of negotiation between multiple needs: ecological potentials, political domination on a local scale, (only occasionally) grand designs emanating from centres and world systems, and the bottom-up choices made by the people who inhabited them. Marginality is only one model; for some periods, we should think of a world with centres which people opted out of, with a thousand locally-defined centres, or with no centres and margins.

399 (RE)CONSTRUCTION OF LARGER BUILDINGS BASED ON ARCHAEOLOGY

Theme: 6. Interpreting the archaeological record
Author: Paardekooper, R.P. (Netherlands) - EXARC
Co-Author(s): Wolters, S. (Germany) - Geschichtspark Bärnau-Tachov
Keywords: museum, interpretation, reconstruction, methodology
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

There are about 300 archaeological open-air museums across Europe with altogether about 1,000 buildings constructed based on archaeology. While much is known about the planning and building process of regular farm houses, the work on larger buildings including monasteries, castles, amphitheatres et cetera, requires a whole other approach. This session brings together some examples from different archaeological open-air museums throughout Europe to discuss the dos and don'ts including the need for solid research and planning: where does archaeology end and the museum takes over?

01 THE MANY FACES OF AUTHORITY: CASTLES, POWER CENTRES AND THEIR LANDSCAPES IN THE LORDSHIP OF GALLOWAY, SCOTLAND, 12TH-14TH CENTURIES.

Author: Mr. Wyeth, William - University of Stirling & Historic Environment Scotland (Presenting author)
Keywords: Castles, Scotland, medieval
Presentation Preference: Oral

The villainous Galwegians of medieval chronicle fame have in the past three decades been banished from critical historical discussion. More nuanced research has sought to frame the emergence of independent Galloway and its incorporation in the Scottish Kingdom over the course of the 12th to 14th centuries in terms of the regional politics of the Irish Sea zone and the Anglo-Scottish interface. Certainly the castles of the Lordship of Galloway which have been the subject of recent surveys and nuance to this more sober image of the region's medieval past. This paper aims to examine a selection of castle sites in the Lordship and add to the picture a consideration for their landscape, examining specifically settlement (through place-name studies) and the larger socio-economic environment. It considers what three different physical forms of power centre – a crannog (Lochrutton), a castle (Turnberry) and a settlement (Kirkcudbright) – might suggest about Galloway's emergence and transformation over the 12th-14th centuries

401 IRON PRODUCTION, TRADE AND CONSUMPTION AS BRIDGE BUILDERS DURING THE MIDDLE AGES AND THE EARLY MODERN ERA

Theme: 6. Interpreting the archaeological record
Author: Haggrén, Georg (Finland) - University of Helsinki
Co-Author(s): Karlsson, Catarina (Sweden) - Bergslagens medeltidsmuseumMagnusson, Gert (Sweden) - Jernkontoret
Keywords: Iron, production, trade, migration, diaspora
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Iron production and trade built bridges connecting different parts of premodern Europe. Our aim is to discuss how periods of expanding iron production as a precursor leaves its mark on society, in iron consumption, distribution, trade, workers conditions and social context.
In the Middle Ages and the early modern era different techniques were developed concerning different stages of iron production, from mining to refining final products. This in combination with a changing society, an expanding consumption and trade of iron changed the conditions for life, work and landscape all over the continent.
Production of iron within a new technical systems always had to consider local conditions and traditions. Techniques varied, but also the social organization of the production as well as the iron markets. The craft and the skill of the blacksmith are fundamental for large scale iron production systems and affect large sections of society through agriculture, forestry, crafts and so on. Some regions, like Bergslagen (Sweden), Wallonia, Steyermark and Basque Country, grew into iron mining and refining centers on a large scale. From these innovation hubs skilled workers migrated to other areas, in a diaspora of specialists. An example of this kind was the migration of Walloon and German workers during the early 17th century.
The archaeological material in the shape of slag, iron waste, bar iron and artifacts gives us a possibility to investigate the craftsmen's knowledge about the material and its properties and at the same time the pattern of the use and consumption of iron.

01 IRON TECHNIQUE, PROCESSUAL KNOWLEDGE AND SOCIAL INTERACTION IN MEDIEVAL AND EARLY MODERN EUROPE

Author: Associate Professor Magnusson, Gert - Stockholm University (Presenting author)
Keywords: technique, social organisation
Presentation Preference: Oral

Wrought iron has been produced with different local techniques more or less all over the world. Techniques developed within local social groups, have in diverse ways been adaptations to local raw materials such as the type of ore, fire wood and charcoal. There have been different kinds of bloomery furnaces, forges and blast furnaces in Europe probably due to different types of ore. More complex techniques probably demanded an exchange of ideas between different regions.
The various raw materials and furnaces required different social organizations. Collecting bog or lake ore could easily be done within a social group such a family, while operating a mine was a much more complicated process, which required a larger group of miners, laborers and several specialists. Especially while introducing new techniques, skilled experts were often needed.
My aim is to analyze how sites of different technical processes reflect various working groups and their skills. The social complexities would differ if running a small bloomery furnace, a forge or a blast furnace. The latter two techniques demanded highly skilled workers, an advanced social structure and larger funding in order to run the operations. This resulted in a division between those who operated the furnaces and those who owned the land as well as the industrial plants like noblemen, bishops, monasteries or highly competent iron producer farmers.
In order to understand any large scale production it is important to recognize the demands and purposes behind. Export oriented trade or special needs such as military preparations might explain the expansion of a technical development of iron production.

02 FERROUS AND NON-FERROUS METALLURGY IN THE VIKING AGE, SPECIALISATION AND SEPARATE ACTIVITIES? CASE STUDIES FROM THE MÄLAR VALLEY

Author: Dr. Sahlén, Daniel - Jernkontoret (Presenting author)
Keywords: Metallurgy, Viking Age
Presentation Preference: Oral

Ferrous and non-ferrous metallurgy in the Viking Age and early medieval period are often viewed as two different types of activities, carried out by different specialists. Ironworking was a more widespread craft and often viewed as a domestic/household craft, while metalworking with copper and precious metals often are regarded as a highly specialist craft.

A detailed analysis of the evidence of metalworking at Viking Age/early medieval sites in the Mälar Valley has demonstrated that casting of copper alloys and precious metals where carried out at a range of different type of sites. This production, particularly at smaller sites, was often found in association with ironworking. Were the crafts at these sites carried out by different specialists or were smiths in the Viking Age/early medieval period working with multiple metals?

This presentation looks at the evidence of ferrous and non-ferrous metallurgy at Viking Age and early medieval sites in the Mälar Valley and aims to discuss how we better can define craft activities and assess their relation.

03 BORDER AREA AND IRON ORE PRODUCTION SITE? - THE NORTHERN FRANCONIAN JURA UPLAND, GERMANY

Author: Mr Lebsak, Michael - University of Bamberg (Presenting author)
Keywords: Iron Production
Presentation Preference: Oral

The northern Franconian Jura upland (Northern Bavaria, Germany) has long been known for its slag heaps, sinkholes and other indications of pre- and protohistoric iron ore production. Yet hardly any effort has been made to associate these archaeological phenomena with the Carolingian establishment of power through royal courts (i. e. Forchheim, Königsfeld, Hallstadt) in this then border region of the Frankish realm. Although the royal courts undoubtedly relied on the control of trade and production networks and resources, no certain early medieval iron ore production or ironworking sites have been found yet. Only the so called "Stechendorf" stray find complex, which was accidently discovered in the autumn of 2016, provides exceptional objects such as an early medieval rotary grindstone, fluid slags and the association of late Carolingian/early Ottonian pottery together with genuine Slavonic organic tempered ware. How can small-scale approaches like stray finds can reveal more information about production, supply, trade, infrastructure and intercultural contacts in the northern Franconian Jura during the Early Middle Ages? This paper aims to discuss the role of iron ore production as a key to cultural exchange, innovation and the establishment of royal power.

04 MINING AND SOCIAL ORGANIZATION

Author: Professor Lindkvist, Thomas - University of Gothenburg (Presenting author)
Keywords: iron-production, social-control
Presentation Preference: Oral

Thomas Lindkvist
Affiliations: Department of Historical Studies, University of Gothenburg
Iron production implied new forms of organization of production and promoted new types of social communities in the mediaeval society of Bergslagen in Sweden. As elsewhere in Europe, new communities were imagined and made coherent by customs and legal regulations. Customary laws changed when representatives of an emerging state and church organization imposed new legislation. There wer different legal traditions. The provincial law codes promoted by King and Church from the late 13th century were focused upon regulating the relations within the agrarian society.
When other forms of social relations emerged due to other forms of production there was a need to settle the new social and economic relations by complementary legislation, byelaws or statutes. One important function of this legislation was to regulate the conditions of labor, i. a. the recruitment of laborers, the wages and the system of apprenticeship.

05 THE MINING DISTRICT OF BERGSLAGEN; WORK, LANDSCAPE AND SOCIETY

Author: Dr Karlsson, Catarina - Jernkontoret; Bergslagens Medeltidsmuseum (Presenting author)
Keywords: medieval, mining, change
Presentation Preference: Oral

The large forested mining areas of Bergslagen are landscapes closely interlinked with the iron production both past and present. In Sweden, the rapid emergence of Bergslagen was vital. The blast furnace was developed, perhaps as early as the 11th century, and around it extensive technical systems took shape, which then grew exponentially during the 1100s-1200s. In Bergslagen, Sweden's economic base was built in sparsely populated outlands. The basis of the paper will be historical and archaeological research and the results of the "Atlas of the Swedish mining districts" where 23 mining districts with medieval origin has been mapped and analyzed. The frontier landscape of the vast, ore-rich outland changed rapidly during this process and was shaped by new technology and people developing and working within the technical system.
The new landscape in the ore-rich woodland was swiftly formed to a different landscape where production of metal molded the conditions for a new type of society based on specialized production. In this landscape the dominating features were mining, charring, blast furnace production, smithing, transport and distribution. The base of this change can be compared to the urbanization that simultaneously changed the landscape in other regions. The dominating agrarian base for work and household economy was challenged by specialization, growing consumers' market and introduction of wage labour. The mining landscapes changed both the actual physical landscape and the social landscape of Bergslagen and the identity of its inhabitants. This paper is focusing on how archaeological evidence and historical sources can help us to understand the new conditions of working and living in the early Swedish Bergslagen areas.

06 THE MINING DISTRICT OF CENTRAL SWEDEN AND THE MEDIEVAL INDUSTRIALIZATION - CHANGE IN MINING AND SETTLEMENT 1000 – 1500

Author: PhD Pettersson Jensen, Ing-Marie - Avesta county; Jernkontoret (Presenting author)
Keywords: medieval-industrialization, blast-furnace, black-death
Presentation Preference: Oral

Based on the dating of medieval blast furnaces, the mining and iron production that started in the 12th century and the 13th century seems to have been the main expansion phase for mining and settlement in the area around Norberg. In the early 14th century
there may have been more than 120 blast furnaces around Norberg. In the second half of the 14th century, 30% of the blast furnaces were closed. Christian ideology broke down the former power of the local Viking Age magnates and dissolved their strong control over
the route taken by the iron to the consumer, and their strong control over the craft and craftsmen was also reduced. Together, this contributed to the quantitative development of iron production, and permitted craftsmen and iron producers to strengthen their social
positions by developing their operations. These actors became stronger during the Middle Ages and had much to win from an increasingly powerful monarchy. The development of the towns and trading created entirely new routes and institutions for the iron to be
shipped down from the mining area. This created the right conditions for the peasant miners to free themselves entirely from the old structures that controlled the mining area and trade. After the Black Death it was increasingly important to be more self-sufficient
and to reside on site, which is why the so-called peasant miner organization reinforced its position and became dominant. But at the same time, the first large scale industrialization of the mining area stopped.

07 EARLY MODERN SWEDISH IRON PRODUCTION INITIATED BY THE CROWN

Author: PhD Haggren, Georg - University of Helsinki (Presenting author)
Keywords: Ironproduction, Castle, Furnace
Presentation Preference: Oral

In the Middle Ages the iron production in Sweden was mainly based on peasant miners called Bergsmän. Beginning from the 1530s and 1540s and based on the initiative of the King Gustaf Vasa, the Crown became a major iron producer. The King ordered his bailiffs to build new forges and furnaces. These new ironworks became a part of industrial activities based on the Crown's estates such as medieval castles and new royal demesnes. One of the King's bailiffs lord Erik Fleming, founded some ironworks in the vicinity to the Castle of Raseborg on the southern coast of Finland. Recent surveys have revealed iron mines, as well as indication of iron making such as slag from both melting and forging processes. The iron mine of Ojamo and the remains of a furnace in Hyttiskogen offer examples of these activities.

King Gustaf Vasa's initiative was followed by his son Duke Carl (later King Carl IX), who invested in modern iron industries in his Duchy of Södermanland. Beginning from the 1590s the Duke recruited skilled workers both from Germany and Wallonia. The iron production organised by Duke was based on the royal castle of Nyköping as well as some royal demesnes. Here we can find the earliest forges and furnaces of the Wallonian type built in Sweden. For example, recent surveys have revealed the ruins of an early 17th century Wallonian furnace in Bränn-Ekeby.

During the 17th century the Swedish forge iron became a trade goods of great importance on the European markets. Especially after the 1640s the production and export of iron was dominated by private entrepreneurs. However, this success could hardly have been possible without earlier initiatives made by King Gustaf Vasa and Duke Carl. Traces of their industrial activities have preserved in sites like Hyttiskogen and Bränn-Ekeby.

08 THE SPREAD OF THE INDIRECT PROCESS IN WESTERN EUROPE. AN HISTORICAL AND ARCHAEOMETALLURGICAL PERSPECTIVE THROUGH IRON ARMATURES USED IN CONSTRUCTION.

Author: L'Héritier, Maxime - Université Paris 8; EA 1571 - HPSS (Presenting author)
Co-Author: Dillmann, Philippe - LAPA-IRAMAT, NIMBE, CEA, CNRS, Université de Paris-Saclay CEA-Saclay
Keywords: Indirect-process, Archaeometallurgy, diffusion
Presentation Preference: Oral

The indirect process is among the major innovations in iron metallurgy. Studying its spread in Western Europe during the late Middle Ages alongside with the persistence of more ancient techniques has a crucial interest to understand how this period of expanding iron production has left a mark on society, through iron consumption, distribution and trade. Better defining the chronology of its implantation is therefore decisive.
Such a study requires an interdisciplinary approach. Historical sources give many clues but usually only reveal the first mention of the new process, a sudden burst giving only a fragmented vision of the material reality. Moreover, the vocabulary is often too ambiguous to precisely describe the technological processes. Archaeological excavations such as that of Glinet (Normandy) help characterising these aspects and give new insights about the dissemination of practices and knowledge, but are still too scarce to provide an accurate picture of the process diffusion in a given territory.
This paper will present how recent archaeometrical studies based on the analysis of iron waste and bar iron used in medieval buildings bring a complementary light to historical and archaeological records, tempering the picture of a process spreading quickly in Western Europe from the 14th century onwards. The true impact of the indirect process on the consumption of bar iron before the end of the Hundred Years' War can now be quantified through the study of the produced material gathered from more than 20 monuments. This impact should probably be minimised even in regions such as Wallonia and Champagne where migrations of German and Walloon workers allowed an early introduction. The influence of blast furnaces and fineries on iron trade and price is on the other hand fairly obvious from the mid-15th century onwards, once the economic and political conditions are more receptive to innovation.

09 THE SPREAD OF THE INDIRECT PROCESS IN WESTERN EUROPE. HISTORICAL, ARCHAEOLOGICAL AND ARCHAEOMETALLURGICAL CONTRIBUTION FROM THE GLINET EXCAVATION (NORMANDY, FRANCE)

Author: Arribet-Deroin, Danielle - Institut d'histoire de l'art et archéologie, Université Paris 1 Panthéon-Sorbonne; LAMOP UMR 8589 (Presenting author)
Co-Author: Dillmann, Philippe - LAPA-IRAMAT, NIMBE, CEA, CNRS, Université de Paris-Saclay CEA-Saclay
Keywords: Indirect-process, Archaeometallurgy, excavation
Presentation Preference: Oral

The indirect process that spread across Northern France in the end of the Middle Ages is a major innovation the impact of which on the market of iron can be known by studying bar iron used in great medieval buildings. From the end of the 14th century onwards, especially after 1450, Walloon workers brought the new technology in the French provinces, including the Pays de Bray region (Normandy) from which it was introduced in England some decades later. This workers migration can be considered as the dissemination of specific knowledge and know-how, of new practices, which required technical choices and adaptations to the environment.
Among the 15 ironworks or so built in the Pays de Bray region, the 16th century blast furnace and finery forge of Glinet were excavated and provided data on the plant structure, the technical processes and the production. The plant is in accordance to the so-called Walloon forge and can be compared to ironworks excavated in Belgium and the United Kingdom and to the Walloon paintings. By analyzing the ore smelted and the products and by-products found during the excavation, we can know specific practices such as the use of a local ore containing phosphorus and the production of phosphoric iron, the use of calcareous flux in the blast furnace and in the finery hearth. We can also make some hypotheses on workers gesture.
This study contributes to show that those practices and knowledge, shared by immigrant and local acculturated workers, created a true technical community in all the provinces where the indirect process was adopted, and so built bridges between social groups and cultures in Western Europe.

402 DEPLOYING THE DEAD: INTERDISCIPLINARY DIALOGUES

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Weiss-Krejci, Estella (Austria) - Austrian Academy of Sciences
Co-Author(s): Becker, Sebastian (Austria) - Austrian Academy of SciencesSmejda, Ladislav (Czech Republic) - Czech University of Life Sciences
Keywords: dead, agency, archaeology, literature, anthropology
Presentation Preference: Session with papers of six minutes and six slides

The past persists in material objects, perhaps most profoundly in the bodies of the long-dead and the material artefacts associated with them. Dead bodies, like those of English King Richard III in Leicester and Miguel de Cervantes in Madrid are erupting into view in contemporary Europe with increasing frequency. Whilst offering clear opportunities for education and the promotion of heritage, such encounters with the dead can pose unsettling questions about cultural identity, the collective past, and the shape of time. Identifying the meanings and mechanisms of past interactions with the dead and their artefacts can inform our understanding of present-day discoveries and dilemmas.

Post-mortem social agency is a complex phenomenon inherent to human behaviour but surprisingly little studied in the full range of its expressions and consequences. How is it that the dead become flashpoints of controversy, interest, and identity for the living? What can the interventions and negotiations of the living with the long dead tell us about the construction of the self, the national past, and the collective future? Harnessing the disciplines of archaeology, literature, and anthropology this session discusses prehistoric and historic encounters with human remains and explores both how literary narratives influence the reception of archaeological discoveries and how material artefacts and human remains disrupt and inspire literary traditions both in the past and in the present.

This Pecha-Kucha session invites papers that focus on encounters with the remains of the dead and their artefacts and agency and uses of the long-dead in modern society.

01 THE MODERN ROOTS OF THE ANCIENT DEAD

Author: Doctor/Phd Reiter, Samantha - The National Museum of Denmark (Presenting author)
Co-Author: Prof. Frei, Karin - The National Museum of Denmark
Keywords: politics, academic responsibility
Presentation Preference: Oral

Can we speak about globalization at a time when the world was still 'flat'? The underlying dogma which lurks behind the recent craze in origin studies of the ancient dead (e.g. National Geographic's Genographic Project) is one which seeks to measure demographic and cultural flows against the multiculturalism and poly-nationalism(s) of a modern globalized world. One can argue that 'history is past politics, politics is present history.' This is perhaps made best apparent in our own backyard; while they do serve an innate interest in omphaloskepsis, the titles of recent EU-funded projects ("Forging Identities" and "Towards a New European Prehistory") can arguably also be seen to push modern roots into the ancient dead, thereby appropriating the past for modern ends.
The study of the ancient dead has tremendous agency, as has been exemplified by the well-known dark years of Gustaf Kossinna to the recent revelations about Egtved Girl, Skrydstrup Woman and Kennewick Man. By means of comparing current political pressures with trends in academic research much in the way as did Wilks (1985), this paper draws out the connections between modern concepts of identity, belonging and the tensions surrounding the admixture involved in refugee crises with the overarching messages broadcast by academic research and ancient cultural studies. Although we might say that, as archaeologists, "our future lies in ruins," the fact remains that we have a tremendous responsibility about the kind of knowledge that we produce and the uses to which it can be put.

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02 SHAKESPEAREAN EXHUMATIONS: RICHARD III, THE PRINCES IN THE TOWER, AND THE "NEOLITHIC ROMEO AND JULIET"

Author: Professor Schwyzer, Philip - University of Exeter (Presenting author)
Keywords: Shakespeare, exhumation
Presentation Preference: Oral

This paper explores how Shakespeare's plays have been invoked and characterised in relation to three celebrated archaeological events over the last century: the exhumation of Richard III (2012), the forensic examination of the putative remains of the Princes in the Tower (1933), and the discovery of a pair of embracing prehistoric skeletons (2007). In the case of Richard III, archaeological and dramatic truths were seen as fundamentally opposed, with the hard evidence of archaeology triumphing over Shakespeare's fiction. Eighty years previously, on the other hand, Shakespeare's plays were cited as evidence that bones interred in Westminster Abbey really belonged to the murdered sons of Edward IV; arguing that the reddish stains on one skull were evidence of suffocation, the forensic report cited Shakespeare's description of the face of Gloucester as "black and full of blood" in Henry VI, Part 2. In 2007, when the remains of a young man and woman were found locked in an embrace in a prehistoric grave near Mantua, the combination of the posture and the location led inevitably to the skeletons being dubbed the "Neolithic Romeo and Juliet." In this case, archaeological and dramatic truths were hailed as mutually confirming. As I shall conclude, the contest of authority between Shakespeare and mortuary archaeology remains an undecided and surprisingly live issue.

03 RESPECT AND THE LONG-DEAD: INTERACTING WITH THE REMAINS OF RICHARD III

Author: Dr Appleby, Jo - School of Archaeology and Ancient History (Presenting author)
Keywords: Richard III, Respect
Presentation Preference: Oral

The excavation and analysis of the dead in archaeology commonly follows codes of ethics that emphasise the role of respect; however, the nature of what respect is, and precisely how it is articulated in practice, is typically left vague. During the analysis of the remains of Richard III, the issue of respect was one that was repeatedly returned to by osteologists, the Richard III society, the media and the public. Whilst all concerned were concerned to show respect, respectful practice was often understood differently, and was sometimes constructed in ways that were mutually incompatible and required dialogue to resolve. Interestingly, whilst this could be seen as reflecting an objective vs subjective approach, different approaches to respect also emerged through associations with Christian practice and through encounters with historical sources that were common to both groups. Ideas of respect were most prominently expressed through control over images and through the physical location of the remains. My experience in this case suggests that in our interactions with the long dead, we need to examine much more closely what we mean by respectful practice, and to explore how this emerges out of interactions between osteologists, the bodies of the dead, and both historical and modern cultural context.

04 CANNIBALISM OFFERS DELICIOUS FOOD FOR THOUGHT

Author: Dr Smejda, Ladislav - Czech University of Life Sciences Prague (Presenting author)
Keywords: Anthropophagy, Critique, Semantics
Presentation Preference: Oral

In most societies, man-eaters are regarded as feared adversaries of humanity, personifying a complete negation of respectful treatment of the dead. At the same time, cannibalism is largely thought to have been prevalent in and intrinsic to "uncivilised" populations. A fierce debate within social sciences has been raging over the past decades whether these statements are true and what functional or symbolic meanings could have been attributed to the phenomenon of anthropophagy. Historical and ethnographic accounts abound with reports of practiced cannibalism, seconded by suggestive archaeological finds, always unfailingly catching the public's imagination.
This presentation aims to approach the dispute between the "believers" and "deniers" of the once-widespread-cannibalism theory from a new viewpoint, de-constructing the traditional arguments and offering a fresh perspective, capable of bridging the gap between both scholarly camps. The most significant obstacle to finding a common ground lies in the semantic ambiguity of the terms anthropophagy, cannibalism etc. Everyone seems to have a clear idea about the meaning of these words but on the second thought, it is extremely difficult to come up with a universal, non-contradictory definition.
The paper presents the conclusion that cannibalism is a real practice as much as a legendary tale, but above all, it is a semantic field used in the largely selective and subjective classification of phenomena that engage our minds. Cannibalism, real or fictitious, is a classic archetype, if perhaps an extreme one, of encounter with the dead, with their materiality and qualities susceptible to the sensory perception of the living. It is an inexhaustible source of fascination and inspiration in fairy tales, literature, visual arts, political propaganda, and an omnipresent part of human condition, regardless of the general confusion that continues to surround it.

05 CONTINUING BONDS: PAST LEGACIES AND FUTURE DIRECTIONS IN RESEARCHING INTERACTIONS WITH THE DEAD

Author: Doctor/Phd Büster, Lindsey - University of Bradford (Presenting author)
Co-Author: Dr Croucher, Karina - University of Bradford; Dr Dayes, Jennifer - University of Bradford; Professor Faull, Christina - LOROS Hospice, Leicester; Ms Green, Laura - University of Bradford
Keywords: death, dying, bereavement
Presentation Preference: Oral

In a modern western world, advanced healthcare allows us to detect and monitor long term and life-limiting illness earlier and more comprehensively than ever before. Preservation of life is attempted at all costs, with (inevitable) biological death viewed as medical failure. After death, bodies are whisked away and sanitised – the physical (and social) processes associated with dealing with the dead outsourced to strangers. This was not an option in the prehistoric past. In a world where life was fragile and death close at hand, our ancestors found ways to rationalise their own mortality in ways which now seem alien to us. Retaining continuing bonds with the biologically, but not socially, dead is a recurring theme in many of the funerary rites of the past – and yet only in recent decades have we challenged the modern assumption that 'getting over grief' is the best solution for everyone. The modern world is certainly very different from that of the past, and we face our own unique challenges in dealing with death – not least in the problematic nature of static memorials in a highly mobile, global society. Yet, many of the emerging 21st century practices echo those practiced by the people that we study – and it is new technologies in particular which are helping us to keep our loved ones close. This paper draws on current research by the AHRC-funded Continuing Bonds Project, which is using archaeology to challenge and inform contemporary palliative care and beyond.

06 WORKING ON THE BASE - HOW AN EGYPTIAN PREDYNASTIC BURIAL CAN SERVE AS A POPULARISATION TOOL IN MODERN EUROPE

Author: Dr. Debowska-Ludwin, Joanna - Jagiellonian University in Krakow (Presenting author)
Keywords: Egypt, Predynastic, popularisation
Presentation Preference: Oral

In many respects the ancient Egyptian civilisation can be seen a distant predecessor of the present European culture. That is why we believe the most recent results of field works conducted by European teams in Egypt should be presented to wider European public, and the easiest way to enforce public engagement in professional projects is to work on the base – that is with the youngest members of a society. With the assumption in mind, we came up with an idea of a series of workshops organized for kids in various ages that would show the basic outcome of our present work. As specialists experienced mainly in Egypt and the Near East we decided to build the project on what we know the best, and what can draw the maximum of interest. That is why our background became a series of cemeteries of the 4th and 3rd millennium BCE which has been discovered at the site of Tell el-Farkha, the Nile Delta. Graves found there represent various types of sepulchral structures that document the earliest burial practices of Egypt.
According to present Egyptian antiquities law, all items discovered in Egypt must remain in the country, so the only way of promoting the finds on the European ground are models and digital reconstructions/visualisations. And thus, a full-size kids-proof model of an Egyptian Predynastic burial was chosen the base of our workshops. Details of such an improvised grave became the keys of interest of the project participants giving them the opportunity to learn about the earliest Egyptian customs, the archaeology and its methods, and the most recent European contribution to uncover ancient Egypt.
In the presentation, by showing the outcome of the project, we will discuss the usefulness of such an approach for building deeper public engagement to Egyptology in modern Europe.

07 DEPLOYING THE TOMB: A SPATIAL REFERENCE AND MATERIAL SYMBOL OF THE URBAN SWAHILI

Author: Dr Baumanova, Monika - University of Uppsala; University of Basel (Presenting author)
Keywords: Swahili, tombs, space
Presentation Preference: Oral

Swahili towns dating from the 11th to 16th centuries AD, before the arrival of the modern Europeans to East Africa, are known for their complex and often monumental built environment. These towns incorporated wattle-and-daub houses as well as structures built of stone. One of the well-preserved types of monuments found along the 3,000 km stretch of East African coast is the stone tombs.

The Swahili were an Islamic society, involved in long-distance trade networks of the Indian Ocean world and reaching inland into the African continent. Given the nature of this trade, the towns represented cosmopolitan communities, accommodating people from a range of cultures and worldviews. In this context, archaeologists, ethnographers and architectural historians have repeatedly asked what was the role of the monumental tombs, that may be found solitary standing and/or in association with houses and mosques with the towns proper.

A substantial body of oral evidence and sometimes inscriptions on the tombs refer to the dead buried there, and processions and pilgrimages in the recent past and present were organised for commemoration of the dead. However, many tombs were built without recorded dedication to a specific person, and bodies could have been added to pre-existent tombs. Adopting a comparative perspective and considering the placement of the tombs within towns may help us to derive how the formal and contextual properties of the tombs ultimately took on a long-term cultural importance. The reference to the dead buried in the tombs was probably local and more limited in terms of temporal relevance, compared to how the tombs were deployed in demarcating Swahili identity in a region experiencing the effects of early globalization.

08 WHY DOES A MINORITY COMMUNITY REFUSE TO EXPLOIT ITS LOVED ONES ?

Author: Ph.D Shay, Talia - Former senior lecturer ,Technion Haifa , the technical insitute of Israel (Presenting author)
Keywords: archaeology of remembrance
Presentation Preference: Oral

In modern times, graves and funerals are not employed only to reflect the life and death of bygone societies but also as means to assert and construct the cultural identity of the living. This change of focus is related to the identity politics that enables minority groups to demand their rights, and to the impact of the postmodern approach of the last century that represents alternative interpretations of reality. Few groups, however, refuse to exploit the memory of their dead. My paper concerns a minority community of Chris-

tian–Palestinians who live in Israel and have avoided exploiting the cemetery of their ancestors as a rhetorical space for their collective memory. The cemetery which is fenced but unattended is dated to the end of the Mandatory time in Israel- between the end of the 19th century until 1945, just preceding the establishing of the state of Israel.

In view of the literature on the "archaeology of remembrance" the question is why is this cemetery intentionally relegated into oblivion?

The explanation of this paradox includes political reasons such as the colonial history of the community before and after the establishment of the State of Israel in 1948, cultural values and internal conflicts within the community. It possibly also consists of the fear of overabundance of historical information on this twilight period that risks neutralizing and trivializing the seismic events caused by the Israelis gaining the upper hand in the Palestinian-Israeli conflict, especially when publicity could have traumatic political implications for the community.

09 READING THE DEAD: APPROACHING FUNERARY COMPLEXITY THROUGH DIGITISED ARCHIVES

Author: Dr Becker, Sebastian - Austrian Academy of Sciences (Presenting author)
Keywords: burials, digitisation, archives
Presentation Preference: Oral

In as much as funerary archaeology happens in the field, it happens behind the desk. Ever since the ascent of archaeology as a scientific discipline, archaeologists have recorded their findings in texts. Thus there exists a vast archive of written material that may be rather useful for archaeological analysis. That is especially true if such sources are digitised and studied with analytical software.

This paper demonstrates the potential of one such archive to shed light on people's engagement with long-dead bodies. It focuses on the journal Fundberichte aus Österreich (Find Reports From Austria) which has been published for almost a century. Thus it provides a rich source of information on archaeological fieldwork in Austria and, in its digital format, a valuable analytical tool.

Within this archive there are a number of intriguing examples, illustrating how long-dead bodies have been treated and dealt with in different periods. Examples include the consistent reopening of graves and subsequent removal of human remains; the re-deposition of select bones in new contexts; the modification of individual bones for different purposes. Utilising the diachronic and geographic breadth of a digital archive, this paper identifies the treatment of long-dead bodies as a recurrent phenomenon in the archaeological record: one that, in various forms, continues to the present day.

10 THE BODIES: THE ARCHIVE OF THE OUTER WORLD

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Keywords: Cemetery, medieval, geochemistry
Presentation Preference: Oral

The bodies of dead people are studied in many aspects such as anthropological, health or dietary. We present our findings of research of the bodies as archives of the environment, particularly as archives of the pollution coming from medieval mines and smelting areas. The data comes from the cemetery of the All Saints' Church in Sedlec near Kutná Hora (central Bohemia) – the church with famous ossuary. The cemetery was excavated in 2016 and 2017 due to the church reconstruction. We have sampled the sediments of all strata from geological background to modern cemetery surface. Also the grave infillings and the space of the bodies were sampled. We focused on these questions: can the grave infilling be used as a record of the medieval pollution? Is there a difference between the infilling and the materiál coming directly from the body? Are the the differences among the body parts? We analysed all main pollutants of the Kutná Hora region (As, Cu, Pb, Zn) by XRF spectrophotometry. The findings have shown that there is some diversity in information that can be revealed by this approach.
This work has been supported by the the HERA JRP2-CE project 'Deploying the Dead: Artefacts and human bodies in socio-cultural transformations' (DEEPDEAD).

11 EMPOWERED OBJECTS: AMULETS AND POST-MORTEM AGENCY IN MEDIEVAL AND POST-MEDIEVAL EUROPE

Author: Dr Weiss-Krejci, Estella - Austrian Academy of Sciences (Presenting author)
Keywords: amulet, relic, agency
Presentation Preference: Oral

The paper discusses how agency of the dead manifests itself through material culture. It focuses on amulets, which were temporarily or permanently worn on the body to ward off evil and disease. In German-speaking Europe, this custom lasted from the early Middle Ages through to the twentieth century. An amulet's shape often was either determined by a specific saintly body part (e.g. St Nepomuk's tongue) or by the weapon with which a martyr had been killed (e.g. one of the arrows that killed St Sebastian). An amulet could also represent a so called 'measurement of a sacred person' ('Heilige Länge'). Apart from amulets, the paper also discusses the Archducal Hat, a peculiar metal and textile crown that was related to a mortuary context and used by the Habsburg emperors for two hundred years during the oath of allegiance ceremony. Throughout the enthronement ritual, the crown was treated as if it were a person in its own right. Such use of headgear in rituals of political empowerment is a phenomenon that is not restricted to Europe but can be found in other areas of the preindustrial world. The paper looks into the processes by which these objects assumed their power.

12 QUARRYING THE 'COR': THE HEART-CASE OF ROGER DE NORTON

Author: Dr. Howell, Naomi - University of Exeter (Presenting author)
Keywords: Heart-burial
Presentation Preference: Oral

In 1872, a curious object was discovered under the paving of St Albans Abbey. At the base of a cylindrical hole near the east end lay a decayed round wooden box. This was soon identified as the heart-case of Abbot Roger de Norton (d. 1291). Separate burial of the heart was fairly unusual for monks, still more so when the body was interred within the same

building. The container, too, is unlike others of the period, for it clearly originates in the Islamic world and bears a benedictory Arabic inscription in Kufic script. Probably created in eleventh- or twelfth-century Afghanistan, the box was already more than a century old at the time of its reuse and burial.

While the box participates in a contemporary fashion for real and feigned Arabic text on high-status objects, it also highlights a complex relationship with the Saracen world. For the clergy of thirteenth-century St Albans, the Saracens were strangely close to home – or rather, their distance from contemporary St Albans could be seen as a matter of time rather than space. Matthew Paris's Vie de St Auban presents itself as the work of a 'miscreant Saracen' who became a Christian after witnessing the death of Britain's first martyr. Elsewhere, Matthew elaborates the story, describing the excavation and discovery of St Alban's 'Life' amid the ruins of Roman Verulamium. Used as a quarry for the construction and expansion of the Abbey and Church of St Albans throughout the medieval period, the ruins yield the foundational narrative, presented as a Saracen story of the Christian protomartyr. This paper explores the surprising reciprocity that emerges when this very fabric receives back into itself the Christian heart of Roger de Norton in its Saracen container.

403 DIVING INTO WASTE: FOOD STUDIES FROM FILTHY CONTEXTS.

Theme: 6. Interpreting the archaeological record
Author: Pena-Chocarro, Leonor (Spain) - INSTITUTO DE HISTORIA, SPANISH NATIONAL RESEARCH COUNCIL
Co-Author(s): Pérez Jordà, Guillem (Spain) - INSTITUTO HISTORIA, SPANISH NATIONAL RESEARCH COUNCILSadori, Laura (Italy) - Università degli Studi di Roma La SapienzaMasi, Alessia (Italy) - Università degli Studi di Roma La Sapienza
Keywords: LATRINES, FOOD, PARASITES, ARCHAEOBOTANY, ZOOARCHAEOLOGY
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

MERC
Medieval Europe Research Community

Latrines, cesspits, sewers and other waste places are common features in the archaeological record of many European urban sites from the Roman period onwards. These contexts provide important information on the daily life of the communities using them. Waste from food including seeds, fruits, bones and mollusks, insects, parasites and many other items of organic origin (hair, skin etc.) are commonly found together with other waste material and rubbish in these trash places.Apart from the environmental information that can be obtained, the study of food waste and faecal material from latrines, sewers and contexts alike allows exploring a large variety of issues related to food and its consumption, e.g. culinary habits, food trade and imports, diseases, or population health and hygiene. The aim of this session is to approach the study of these various aspects through the analysis of archaeobiological material from latrines, sewers and cesspits from Roman and Medieval case studies.We seek contributions focusing on the study of different types of organic materials from food waste and faecal material that highlight the potential of these contexts for advancing our knowledge on Roman and Medieval food related issues such as dietary habits and food preparation. Special emphasis will be given to interdisciplinary approaches and new methodologies.

01 SORTING THROUGH GARBAGE. APPROACHING THE STUDY OF PLANT FOODS IN AL-ANDALUS

Author: Dr Pérez-Jordà, Guillem - CSIC
Co-Author: Dr Peña-Chocarro, Leonor - CSIC (Presenting author); Dr Alonso, Natalia - Universitat de Lleida (Presenting author)
Keywords: Islamic, Iberia, latrines
Presentation Preference: Oral

In the Islamic cities of Al-Andalus, latrines were systematically built in many houses. The archaeobotanical material coming from feces and other waste has been commonly preserved by mineralization and it contains many plant remains that were consumed by the inhabitants of these houses. These records preserved in latrines, cesspits and contexts alike allow exploring the plant component of food in these communities. Mineralization particularly favors the preservation of fruits, oil plants and some spices while other elements of the plant human diet such as cereals and legumes get preserved more rarely in these contexts. Despite its limitations, the study of latrines, cesspits and similar structures provides interesting insights into food that can be complemented with information from other contexts where plant material has been preserved by charring.
In this paper, we present results from the study of latrines in two different areas of Al-Andalus: the north-east of the Iberian Peninsula and the Balearic Islands, in particular the island of Ibiza. In the north-east, we will present the plant assemblages from the city of Medina Larida (Lleida) dated to the 9th-11th centuries AD and Pla d'Almatà (Balaguer, in Lleida province) from the 10th -11th centuries AD. In Ibiza, we will examine the material from Yabisa (city of Eivissa). The plant remain assemblages include a large number of fruits (figs, grapes, pomegranate, quince) as well as other plant foods such as melon/cucumber and oil plants (flax, gold of pleasure) together with several spices.

02 UNINVITED AND UNCLEAN- PESTS, DISPERSAL, EXCHANGE NETWORKS AND DISEASE

Author: Dr Eva, Panagiotakopulu - School of GeoSciences, University of Edinburgh (Presenting author)
Keywords: insects, biogeography, disease
Presentation Preference: Oral

Insects directly associated with man-made habitats provide a different biogeographic angle on migration, colonisation and the homogenisation which shaped post-medieval and modern environments. Evidence from floors, garbage heaps, stored food residues and latrines provides information on the early expansion of pests of stored products from their original natural habitats into Europe and also gives an insight into landscape management, introduced plants and animals, agriculture and infectious diseases. The importance of human induced change as a driver for the spread of synanthropic faunas and the potential for the spread of disease during this process are discussed. Results from Palaearctic contexts, primarily associated with faeces and food waste provide maps of distribution of synanthropic insect species and the footsteps of colonisers and trading networks across the Late Holocene. After the Neolithic first wave of insect introductions, the northern European frontiers of large scale storage of cereals, established during the LBK, appear to retreat, and smaller scale, more local organisation and pastoralism replaces exchange. Roman expansion, with the need to provision large armies sees a return of stored product pests, and consequent losses during storage, reached the most northerly parts of the Empire. During the medieval period, the insect records indicate further expansion and changes which parallel the spread of epidemic diseases like Plague. Post-medieval expansion leads to a great interchange of pests and diseases across the Atlantic and beyond.

03 FISH TAPEWORM AT THE LATE BRONZE AGE SETTLEMENT OF MUST FARM, UK

Author: Mitchell, Piers D. - Department of Archaeology and Anthropology, University of Cambridge, UK
Co-Author: Ledger, Marissa - Department of Archaeology and Anthropology, University of Cambridge, UK (Presenting author); Grimshaw, Elisabeth - Department of Archaeology and Anthropology, University of Cambridge, UK; Fairey, Madi - Department of Archaeology and Anthropology, University of Cambridge, UK; Ballantyne, Rachel - McDonald Institute for Archaeological Research, University of Cambridge, UK; Knight, Mark - Cambridge Archaeology Unit, UK
Keywords: Parasites, Bronze Age
Presentation Preference: Oral

The site of Must Farm is one of the best-preserved Late Bronze Age pile-dwellings in North-western Europe. Located in the freshwater marshes of East Anglia, it was comprised of a series of round timber structures enclosed by a palisade, all constructed over a slow-moving river. Very little is currently known about the kinds of intestinal diseases that infected people in Bronze Age Britain as latrines were only introduced in the Roman Period. Therefore, samples of sediment dating from the time of occupation were taken from five dwellings at their excavation, along with on-site control samples of contemporary sediments from upstream and downstream. The samples were processed using microsieves and analysed with digital light microscopy to detect the eggs of intestinal parasitic worms. It was found that the eggs of fish tapeworm (infects humans and other mammal carnivores) and pig whipworm (infects pigs) were found at locations across the site. This is the first evidence to show that either of these parasites was present in Britain prior to the arrival of the Romans. Fish tapeworm in northern Europe is contracted by eating raw, smoked, pickled or undercooked freshwater fish, so it seems very likely the inhabitants ate at least some of their fish this way. It is interesting that roundworm and whipworm, generally common in early farming communities across Europe, does not seem to have been present in this population. It does appear that their marshy environment put them at risk of one intestinal parasite, while potentially protecting them from infection by other species.

04 WASTE TALKS: FILTHY CONTEXT OF VILNIUS LOWER CASTLE (13TH-17TH C.)

Author: Dr Blaževičius, Povilas - Vilnius University (Presenting author)
Co-Author: Dr. Piliciauskienė, Giedrė - Vilnius University; Rumbutis, Saulius - Tadas Ivanauskas Zoological Museum
Keywords: daily life, diet
Presentation Preference: Oral

Vilnius Lower castle and the Palace of the Grand Dukes of Lithuania (13th-17th c.) are objects of an extraordinary importance for Lithuanian state history. Dwellers of various social stratus – kings, dukes, bishops, knights, officers, soldiers as well as craftsmen and servants lived in the territory of the castle through the centuries. Since the middle of the 20th c. an area of about 18,000 m2 was excavated there. Dozens of latrines, sewers and water-supply pipelines were examined, more than half of million archaeological artefacts were collected and ca. 40,000 animal bones fragments were analysed as well as parasitological and archaebotanical analyses were done. The aim of our presentation is to present the most significant results of the zooarchaeological, archaeobotanical and parasitological analyses from Vilnius Lower Castle latrines, cesspits and other waste pits. During the last few years of investigations unexpected evidences for widely butchered horses, the earliest turkey (Meleagris gallopavo L.) and plentiful intestinal parasites came to the light. Rich archaeological, historical and bioarchaeological data allow us to reconstruct daily life, diets and hygiene habitats of castle dwellers.

05 INTESTINAL PARASITES FROM A LATRINE IN THE ROMAN BATHS OF SAGALASSOS (TURKEY): IMPLICATIONS FOR SANITATION, COOKING PRACTICES, AND MEDICAL TREATMENT

Author: Dr Mitchell, Piers - University of Cambridge (Presenting author)
Co-Author: Ms Williams, Faith - University of Cambridge; Mr Arnold-Foster, Theo - University of Cambridge; Dr Yeh, Hui-Yuan - Nanyang Technological University, Singapore; Dr Baeten, Jan - Catholic University of Leuven, Belgium; Prof Poblome, Jeroen - Catholic University of Leuven, Belgium
Keywords: latrine, parasites, dysentery
Presentation Preference: Oral

The aim of this research was to determine the species of intestinal parasites present in a Roman period population in Asia Minor, and to use this information to improve our understanding of health in the eastern Mediterranean region in Roman times. We analyzed five samples from the latrines of the 2nd-5th century AD imperial bath complex at Sagalassos, Turkey. Fecal biomarker analysis using stanols has indicated the feces were of human origin. The eggs of roundworm (Ascaris lumbricoides) was identified in all five samples using microscopy, and the cysts of the protozoan Giardia duodenalis (which causes dysentery) was identified twice in one sample using ELISA. The positive G. duodenalis result at Sagalassos is particularly important as it represents the earliest reliable evidence for this parasite in the Old World (i.e. outside the Americas). As both these species of parasite are spread through the contamination of food and water by fecal material, their presence implies that Roman sanitation technologies such as latrines and public baths did not break the cycle of reinfection in this population. We then discuss the evidence for roundworm and the treatment of intestinal worms in the writings of the Roman physician Galen, who came from Pergamon, a town not far from Sagalassos.

06 DIET AND IMPORTATION OF NEW PLANTS IN BURGUNDY. THE STUDY OF WELLS TO KNOW THE DIET DURING THE ROMAN PERIOD.

Author: Archaeobotanist desiderio, anna maria - Inrap (Presenting author)
Keywords: Cesspits Latrines Burgundy
Presentation Preference: Poster

The project to construct a gas transmission pipeline from the north to the south of France, several excavations have been made in a region that is still poor for archaeobotanical studies. The excavations made in the town of Genlis, near the city of Dijon The excavation showed a succession of periods ranging from the iron age to the middle ages. Structures such as sinks and latrines were taken for carpological studies and the results showed a high consumption of table fruit and plants imported by the Romans.Our results aim to show how plants from other environments have been perfectly implanted in different environmental contexts.

07 A TASTE OF HISTORIC COOKERY: A RECONSTRUCTION OF THE DAILY MEAL BASED ON ARCHAEOBOTANICAL MATERIAL, HISTORICAL SOURCES AND EXPERIMENTAL GASTRONOMY

Author: Drs Hondelink, Merit - University of Groningen (Presenting author)
Keywords: Archaeobotany, History, Latrines
Presentation Preference: Oral

In the course of the Early Modern period, the population of the Netherlands gradually increased. In addition to population growth, the Netherlands also experienced strong urbanisation. In order to enable, sustain and feed a growing urban population, both the rural and urban landscape, economy and society underwent massive changes. The food choice and alimentary practices of the population also changed markedly in this period.

Although historical and archaeological studies pay more and more attention to past food economies, our understanding of the food and alimentary practices of the common Dutch burgher is still far from complete. My project aims to fill this lacuna by investigating what the common burghers of Early Modern Dutch cities ate, how they prepared their daily meal and how they disposed of their waste.
Suitable evidence for the research of food and alimentary practices of the common Dutch burgher comes from 1) bio-archaeological material, taken from cesspits and latrines, 2) historical sources, amongst others cookbooks, probate inventory and market inventories, and 3) (experimental) gastronomy (i.e. reproducing meals based on historical recipes).

Each source has its individual merits, biases and limitations. By combining them into a singular interdisciplinary study, I expect to avoid biases and limitations. The usage of data from all three disciplines complimentarily would contribute greatly towards consolidating the knowledge on the preparation of the daily meal by common burghers in Early Modern Dutch cities.

404 LANDSCAPE AS THE FRAMEWORK FOR SOCIAL DYNAMICS: QUALITATIVE AND QUANTITATIVE ASSESSMENT OF SURVEY METHODS AND APPROACHES

Theme: 6. Interpreting the archaeological record
Author: Saccoccio, Fabio (United Kingdom) - University of Nottingham
Co-Author(s): Magno, Laura Matilde (Belgium) - Université Catholique de Lovain
Keywords: survey, methodology, landscape, local/regional approach
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Aim of our session is to compare and discuss data from different contexts in terms of chronology, nature and preservation of the archaeological record in order to evaluate new directions in survey application. Although, in the past survey was seen as "skimming the surface or scraping the barrel" (Bowden et al. 1991) nowadays it seems the most affordable way to perform archaeological research.
The use of multidisciplinary and IT methods made possible to overcome some of the traditional biases of survey approaches to the landscape - as a place for socio-political and economical dynamics - giving chance to provide data not only for regional purpose but also for local issues. According to this statement is survey still considered as a "poor cousin" of excavation?
Are we really aware of the positive impact of survey data on our interpretation? Despite 30 years are already passed from the publication of the italian paper "Archeologia di superficie ed archeologia superficiale" - trad. "Surface archaeology and superficial archaeology" - (De Guio 1985), nowadays it seems even more important to rethink critically about this practice especially when, according to new and more restrictive national rules deriving from international political and economic restraints, the access to field research results somehow limited.

01 NON-DESTRUCTIVE MULTIDISCIPLINARY RESEARCH IN NORTHERN CARPATHIAN BASIN – NEW RESULTS OF ISZAP PROJECT.

Author: Dr. Fábián, Szilvia - Hungarian National Museum
Co-Author: Larsson, Nicklas - Hungarian National Museum; Guba, Szilvia - Kubinyi Ferenc Museum; Dr. Salisbury, Roderick B. - University of Vienna, Austrian Academy of Sciences; Szilágyi, Kata - Eötvös Loránd University - Institute of Archaeological Sciences; Dr. Bácsmegi, Gábor - Munkácsy Mihály Museum; Czifra, Szabolcs - Hungarian National Museum; Dr. Serlegi, Gábor - Hungarian Academy of Sciene; Dr. Tóth, Peter - Comenius University, Department of Archaeology, Faculty of Philosophy (Presenting author)
Keywords: Non-destructive-survey, multidisciplinary-methods, Carpathian-Basin,
Presentation Preference: Oral

The Ipoly-Szécsény Archaeological Project (ISzAP) is a research project examining interregional trade networks, cultural change, and human-environmental interactions in the Northern Carpathian Basin and its surroundings. Interpreting social structures, social interactions, and human-environmental interactions from archaeological data is essential both for understanding the past and informing the present. The research area is located in Northern Hungary and Southern Slovakia, in the Middle Ipoly Valley, and covers the southern part of the Ipoly Basin.
A regional survey began in 2015, including surface collections, coring and soil phosphate survey, and development of a regional GIS database. Our goal is to fill in the empty spaces in our archaeological maps of the region, and to gain a better understanding of trade and related social interactions. A principal aim of the project is to locate Middle Neolithic settlements; to map the cultural, economic, and ideological interconnections between these settlements; and to determine the direction of the connections.
In our surveys, emphasis is put on additional non-destructive approaches (e.g., predictive modeling, geophysical survey and 3D terrain modelling). In addition, soil chemistry survey and geological drilling will extend the information we gathered about settlements and the environment, respectively. The considerable areas covered by woodland and pasture, which are inaccessible to field surveying, require alternative prospection methods.

02 MECSEK GEOARCHAEOLOGICAL PROJECT – THE BEGINNINGS OF THE NEW RESEARCH.

Author: Szilágyi, Kata - Institute of Archaeological Sciences - Eötvös Loránd University (Presenting author)
Co-Author: Czukor, Péter - Institute of Archaeological Sciences - Eötvös Loránd University; Dr. Fintor, Krisztián - Department of Mineralogy, Geochemistry and Petrology - University of Szeged
Keywords: Lithic-raw-material, geoarchaeological-survey, Mecsek-Mountain-(Hungary)
Presentation Preference: Oral

The starting point of knappable raw material research is the chipped stone assemblage at Alsónyék (South-Hungary). The Late Neolithic settlement of Alsónyék has got nearly 6000 pieces stone tools. The dominance raw material is Mecsek radiolarite, which located in East-Mecsek Mountain. This area means the local supply zone of the settlement. We know some geological sources (Komló, Hosszúhetény, Kisújbánya, Magyaregregy, Vékény) in the East-Mecsek, but the provenance research of this micro-region stands in a basic level. The color and texture of Mecsek radiolarite are much diversified which reflect the different geological formations. The aim of the project to detect the knappable stone variants and its primary geological sources.
In these field surveys we found many debris excavations and rock outcrops where there were radiolarite in form of pebbles, blocks and bands. We presume that knapping specialist choose consciously the appropriate geological sources and it depended on what type of artefacts wanted to create. Lithic raw materials play an important role in the organization of technology. It is apparent that raw material availability, size, and quality have complex influences on different aspects of stone tool technology. This fact alone makes lithic raw material an important resource for gaining insight into human land use and mobility patterns, and relating those to lithic technology.

03 COMBINING DIGITAL AND TRADITIONAL SURVEY TECHNIQUES: A CASE STUDY FROM NORTHERN ECUADOR INTEGRATING REMOTE SENSING AND PEDESTRIAN SURVEY

Author: M.A. Dyrdahl, Eric - Pontificia Universidad Católica del Ecuador
Co-Author: Ph.D. Montalvo, Carlos - N.A. (Presenting author)
Keywords: survey methods GIS
Presentation Preference: Oral

This presentation aims to illustrate the utility of projection maps created with satellite imagery, Google Maps tools, raster maps, and geographic information systems (GIS) for archaeological fieldwork. In particular, we focus on how these maps can be integrated into research that also applies traditional fieldwork methods such as archaeological survey. We utilize a case study from the northern highlands of Ecuador (Imbabura Province) to demonstrate this. In this instance, these tools helped us confirm and record field data related to archaeological mounds, roads, fortresses, and hydraulic structures. They also aided in the collection and curation of digital, physical, and bibliographic data. Ultimately, this suite of data advanced our interpretation of the cultural evolution of the region and documentation of prehistoric landscape modification. It is our hope that this case study will serve as an example of how to utilize both modern and traditional prospection in future research.

04 GEOARCHAEOLOGICAL SURVEY METHODS FOR COSANGA CLAY SOURCES IN THE NORTHERN HIGHLANDS OF ECUADOR: NEW APPROACHES BETWEEN ANDES AND AMAZON REGION

Author: Ing Sánchez, Luis - Escuela Politécnica Nacional
Co-Author: Master Serrano, Carlo - Sacharxeos (Presenting author); Dr Aldás, Oswaldo - Escuela Politécnica Nacional
Keywords: Cosanga, Geoarchaeology, Amazon
Presentation Preference: Oral

Northern Highlands of Ecuador are recognized by the great diversity of geological, ecological, and cultural characteristics. This diversity has contributed to the development of new definitions concerning the presence of cultural areas and the procurement of raw materials, especially of clays. Over the past 50 years, archaeologists have believed that Cosanga pottery originated exclusively from the lowlands of Napo Province (Sub Andean Amazon 1500 mals), due of the presence of metamorphic minerals in the paste. Its occurrence in the Andean valleys (Pichincha, Imbabura and Carchi Province 2500-3200 mals), occupied by Caranqui culture, was deduced as a long distance exchange. However, clays sources never were located and there was not a regional survey in the different ecologies of the eastern mountain range.
For these reasons, this paper emphasizes in the importance of geoarchaeology in terms to understand the landscape, source areas and their relation with archaeological data to establish new perspectives of interpretation. The research has two sections: first, focused in the stratigraphic profiles record to define the geological context of clays; second, in the identification of primary minerals of Cosanga clays and pottery by X-Ray Diffraction. Finally, the data will allow us discuss clays sources, archaeological sites and ancient roads of Andes and Amazon region.
These results help to rethink the origins of Cosanga pottery by looking new ecological zones (Eastern Cloudy Forest 3300 - 2500 mals), which in the past were considered virgin and pristine. In fact, in these areas near of the Andes, were reported clays and ceramics that have the same primary minerals (quartz and muscovite) as temper. In this way, regional surveys should not be considered a poor source of information, by the contrary; they give us a wide perspective between landscape and humans.

05 UNRAVELLING THE IRON AGE LANDSCAPE IN THE CAMPINE AREA OF FLANDERS (BELGIUM).

Author: Mr Meylemans, Erwin - Flemish Heritage Institute (Presenting author)
Co-Author: Prof. De Bie, Marc - Flemish Heritage Institute
Keywords: Lidar, landscape archaeology
Presentation Preference: Oral

In the last decade landscape archaeological research in Flanders was boosted by the creation of high resolution Lidar datasets. The analysis of this data reveals the presence of a.o. formerly unknown burial grounds and vast stretches of Celtic Field complexes, preserved under forest. These insights are an important addition to other contemporary (late bronze age to early Roman period) archaeological and environmental data.
In this paper we combine various sources to provide a first assessment of the relationship between settlement dynamics, demography and landscape transformations in the sandy Campine areas of Flanders within the envisaged timeframe. We foremost discuss the increasing scale of impact on the landscape, both on local and regional levels, of the transformation of the 'natural' environment towards the Celtic Field agricultural system.
These sources thus include findspots and archaeological excavation reports as listed in the Central Archaeological Inventory database; palaeoenvironmental studies (mainly pollen analysis from natural sequences and from burial mounds); contemporary environmental data (soil maps, geomorphological maps, ...); and remote sensing data (aerial photography, Lidar).

06 LF ARCHAEOLOGICAL SURVEY: PRELIMINARY DATA FOR THE STUDY OF THE TERRITORY IN WESTERN VERCELLAE AREA

Author: Dr. Peverelli, Benedetta - Università di Pavia (Presenting author)
Co-Author: Dr. Smoquina, Elena - Università di Pavia; Prof. Gorrini, Maria Elena - Università di Pavia
Keywords: methodology, landscape, local/regional-approach
Presentation Preference: Oral

In October 2001, during the works for the construction of the new railway TAV Milan-Turin, 1.5 km North of the modern settlement of Livorno Ferraris, in Piedmont, it was brought to the light a necropolis composed by 212 tombs and an important number of grave goods, datable between the 1st and the 4th century A.D.
Since October 2016, the University of Pavia, in collaboration with the Soprintendenza Archeologia, Belle Arti e Paesaggio per le Province di Biella, Novara, Verbano Cusio Ossola e Vercelli, started a 5 years survey project with two purposes: 1) to identify the settlement or the settlements related to the necropolis and 2) to investigate the dynamics of population, the exploitation of the territory, the road-networks from the Late Bronze Age to the Middle Ages, focusing on the Roman period, to reconstruct the ancient landscape of the Western Vercelli province.
The first issue we are going to discuss is the methodological challenge that a survey on the Vercellae plain presents: the current landscape is characterized by the prevalence almost absolute of rice fields, but this dates back only to the nineteenth century. Before then the territory must have been marked by extensive arid plains with forests, heathlands and marshes.
Focus of the project is the GIS DB which aims to integrate all the survey data with the previous number of sporadic findings and structures as well as with the information derived from historical and epigraphical sources in an interdisciplinary approach.
The paper will present the preliminary results of the first survey campaigns discussing the collected data so far, integrating them with the previous knowledge of the territory, and reflecting on the methodological problems that we faced doing survey in the Po valley plain, specifically in an area strongly modified by modern anthropic activities.

07 BURIAL MOUNDS AS LANDMARKS. THE RESULTS OF A FIELD SURVEY

Author: Kogalniceanu, Raluca - Vasile Parvan Institute of Archaeology, Bucharest, Romania (Presenting author)
Co-Author: Dimache, Madalina - Museum of the Gumelnita Civilization, Oltenita, Romania; Morintz, Alexandru - Vasile Parvan Institute of Archaeology, Bucharest, Romania
Keywords: survey, landscape, mounds
Presentation Preference: Poster

The field survey of an entire territorial administrative unit offers the unique opportunity to "feel" the landscape, to grasp the way various sites integrated within this landscape. The technology offers us additional help in analyzing the results of the field survey. But no technology can replace the personal experience of seeing burial mounds in a vast open space, sometimes at distances of over 2.00 km from each other. Only when this happens, one understands the real meaning of the term "landmank" applied to them.
Such a field survey was carried out in the autumn of 2016 for a territorial administrative unit in Southern Romania and led to the identification of approximately 50 burial mounds on an area of 125 sq km, in a landscape cut in two by a river, with high terraces used for agriculture on each side. The visibility is excellent for kilometers and the burial mounds stand out in this landscape, mainly due to their location on the high terrace.
The results of the survey will be presented with a discussion of methods employed during survey and analysis, from the planning phase, through the performing of the survey and the analysis of the data to the final results and their interpretation.

405 CATTLE-BASED AGRICULTURE IN CENTRAL EUROPE - INTRODUCTION, SPREAD AND IMPACT

Theme: 6. Interpreting the archaeological record
Author: Roffet-Salque, Melanie (United Kingdom) - University of Bristol
Co-Author(s): Smyth, Jessica (Ireland) - University College DublinEvershed, Richard P. (United Kingdom) - University of Bristol
Keywords: Neolithic, cattle, husbandry practices, diet,
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

This interdisciplinary session will examine the introduction and spread of cattle-based agriculture by the Neolithic farmers of Central Europe and its implications for modelling the Neolithisation of Northern and Central Europe beginning in the 6th millennium BC. This revolutionary shift in human subsistence strategy reshaped prehistoric European culture, biology and economy, in ways that underlie modern life worldwide.
The session aims to bring together biomolecular, isotopic and morphological studies of faunal, human and other archaeological remains to investigate herding practices. The impact of the introduction of dairying, detectable from organic residues in ceramics and the faunal skeletal-based proxies, into the Neolithic diet on the health and biology of Neolithic humans will also be examined.

The session will provide comprehensive assessments of the ways the first farmers of Central Europe managed and exploited their domesticated animals. Papers from the session will highlight the changing roles of domesticated animals in the diets, economies and evolutionary genetics of Neolithic communities in Central Europe.
We welcome papers on all aspects of the spread of cattle-based agriculture in Central Europe, asking the contributors to emphasise the role(s) and impacts of domesticated animal-based economies on the lives of Neolithic farmers.

01 MODELLING THE EVOLUTION OF LACTASE PERSISTENCE IN EUROPE

Author: Dr Gerbault, Pascale - University of Westminster, London; University College London (Presenting author)
Co-Author: Dr Powell, Adam - Max Plank Institute; Prof. Burger, Joachim - Johannes Gutenberg University Mainz; Prof Swallow, Dallas - University College London; Prof Thomas, Mark - University College London
Keywords: dairying, lactase, modeling
Presentation Preference: Oral

Lactase persistence, the continued expression of the enzyme lactase into adulthood, occurs in about 35% of adults worldwide. It allows the digestion of lactose, the main sugar in milk, without symptoms of intolerance. This dominant genetic trait isn't homogeneously distributed, but occurs more frequently in populations with a history of herding and dairying, reaching a frequency of up to 95% in North-western Europe. In Europe one major allele (-13,910*T) appears to be responsible for the trait. Population genetic estimates of the age of this allele bracket the dates for the domestication of milkable animals, around 10,000 years ago. Computer modelling simulating the spread of this allele with farming, coupled with approximate Bayesian computation, indicate that this allele had been subjected to strong positive selection beginning Central Europe. We present an update of this simulation model to investigate whether this scenario still holds when recent information is taken into account, including ancient DNA -13,910*T allele frequencies and archaeological record of dairy fat residues.

02 THE ORIGIN OF DOMESTICATED CATTLE IN EUROPE – AN ANCIENT DNA PERSPECTIVE

Author: Dr Scheu, Amelie - Johannes Gutenberg-University Mainz, Palaeogenetics Group (Presenting author)
Keywords: ancient DNA, domestication
Presentation Preference: Oral

Cattle, as the most important livestock species, are kept throughout the world in a great variety of environments and for many purposes in hundreds of breeds. While archaeological, archaeozoological and population genetic studies have increasingly converged on a single southwest Asian origin of taurine cattle some 10,000 years ago, the complex patterns of subsequent population dynamics, including migration, selective breeding and potential hybridisation with local wild animals outside the primary domestication centre are less well understood. Ancient DNA studies on small fragments of mostly non-coding mitochondrial DNA markers were already able to unveil past genetic diversity patterns, to connect them with Neolithic expansion routes and to infer effective population sizes at the beginning of cattle domestication. However, further substantial questions concerning complex patterns of population movements throughout time, man-mediated or natural selection and hybridisation require the in-depth analyses of chromosomal DNA. Next Generation Sequencing technologies have recently revolutionised molecular genetics by permitting cost and time-effective sequencing of even prehistoric full genomes. Analysis of the first full ancient cattle genome from a British Mesolithic aurochs provides evidence for at least some hybridisation between European aurochs and imported domesticated cattle. This paper outlines how additional full genomes of ancient domesticated and wild cattle through time and space not only allow to explicitly address questions regarding the when and where of hybridisation, but also help to understand the complex process of domestication itself.

03 ADAPTATIONS OF NEOLITHIC CATTLE HUSBANDRY TO CENTRAL EUROPE: INTEGRATION OF THE WOODLAND LANDSCAPE COMPONENT, SEASONAL REPRODUCTION, CONSEQUENCES ON DAIRY ECONOMY

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Keywords: cattle Central Europe
Presentation Preference: Oral

Although the economic orientations of cattle husbandry in the Early Neolithic of Central Europe have been the subject of strong interest (evidencing milk exploitation, in particular), the modalities of it have been investigated to a lesser extent. Agriculture expanded in Central Europe during a climatic optimum with wetter conditions and reduced seasonal contrast, and in environments with significant to dominating woodland components. Although consequences drawn on subsistence strategies have focused on plant cultivation, the way environmental parameters also impacted husbandry (animals and practices) should be carefully considered. Two questions in particular may be addressed: how was the woodland landscape component integrated into cattle husbandry systems? Can we characterize cattle reproduction cycle and what consequences should be drawn for dairy economy? Constraints and responses certainly differed among regions. As a first step, this presentation will present a stable isotope dataset illustrating the seasonal rhythms of cattle husbandry at the two LBK sites of Chotěbudice and Černý Vůl in Bohemia. Those will be assembled with similar data from contemporaneous sites in Hungary, Poland and eastern France, providing a larger view on the landscape setting of LBK cattle husbandry. Secondly, these results will be compared with those obtained at earlier sites from the Starcěvo complex in the Balkan area, from where the origins of the Early Neolithic of Central Europe lie. A synthesis will be eventually proposed for cattle birth distribution on a wider scale for the Neolithic of Europe, in order to evaluate how LBK cattle husbandry stands out based on this parameter.

04 THE EFFECT OF TROPHIC LEVEL ON INDIVIDUAL AMINO ACID Δ15N VALUES IN A TERRESTRIAL RUMINANT FOOD WEB

Author: Mr Kendall, Iain - University of Bristol (Presenting author)
Co-Author: Prof Evershed, Richard - University of Bristol
Keywords: Compound-specific, Nitrogen, Trophic
Presentation Preference: Oral

Bulk collagen nitrogen isotope analysis has been extensively used to investigate past diet and trophic positions of humans and animals. However, bulk values are an average of the δ15N values of the constituent amino acids, reflecting both the nitrogen source and the effect of complex metabolic processes. This can complicate interpretations of bulk data; using compound-specific isotope analysis of amino acids can help to elucidate these metabolic effects on bulk δ15N values. Although trophic level effects on individual amino acid δ15N values have been previously investigated in aquatic ecosystems and terrestrial invertebrate food webs, most archaeological applications involve terrestrial herbivores, and therefore a greater understanding of these effects between diet and consumer in a terrestrial herbivore food chain is required. The analysis of pasture plant protein and cattle collagen from the North Wyke farm platform, a well-defined and well-controlled food web in which the animals' diet is precisely known, helps to clarify the effect of trophic position on individual amino acid δ15N values. In this study, trophic shifts in δ15N values in this ruminant food web were found to follow different patterns from aquatic and invertebrate food webs, with a trophic enrichment factor of 4.0‰ compared to the commonly used 7.6‰ in ecological and archaeological studies. This emphasises the need to understand the trophic shifts in the particular food web being investigated in order to apply isotope based investigations in archaeological contexts. This method will be applied to archaeological cattle remains from Neolithic Europe to better understand herding practices and landscape use.

05 INTRODUCING BYLANY LBK CULTURE THROUGH ORGANIC RESIDUE ANALYSIS

Author: Ing. Brychova, Veronika - UCT Prague, Czech Republic; Department of Radiation Dosimetry, Nuclear Physiscs Institute, The Czech Academy of Sciences, Czech Republic (Presenting author)
Co-Author: Dr. Roffet-Salque, Melanie - University of Bristol, UK; Prof. Pavlu, Ivan - Institute of Archaeology of the Academy of Sciences of the Czech Republic, Czech Republic; Prof. Filip, Vladimir - UCT Prague, Czech Republic; Prof. Evershed, Richard P. - University of Bristol, UK
Keywords: Pottery, Lipids, Chromatography
Presentation Preference: Oral

Neolithic site of Bylany (Czech Republic) is one of the largest central European Neolithic settlement with well-described LBK and following STK culture. Due to environmental and historical reasons, archaeobotanical and archaeozoological information are lacking in Bylany. Pottery, macrolithic tools and position and type of houses, pits and trenches are, thus, only source of information to examine household economies and activities at the site. Through the methods of organic residue analysis, we investigated more than 280 potsherds which were sampled from two different Bylany ceramic phases, early phase 8 and later phase 19. Above that, potsherds were sampled from different house types and according to 14 perspective categories of presumed use which were determined by ethnographic markers to water processing, food serving and storage vessels. The sherds exhibited very good recovery of total lipids. More than 70% (phase 19) and more than 85% (phase 8) potsherds yielded appreciable amounts of lipids mainly dominated by C16:0 and C18:0 free fatty acids. Compound-specific carbon isotope compositions indicated origins predominantly from ruminant and non-ruminant animal fats. Good preservation and recovery of lipids in potsherds indicated that many of the sherd originated from cooking, food-processing or food-serving vessels. Furthermore, very long fatty acids, fatty alcohols and traces of di- and triterpene compounds were also detected and indicated a combination of meat- and plant-based diet components and specialised use of some vessels. Use of vessels for milk-collecting or processing wasn't detected, suggesting cattle or other ruminants were probably not milked in Bylany. The ethnoarchaeological vessel typology wasn't entirely consistent with the results of organic residue analyses. A combination of a standard archaeological typology and organic residue analysis should be combined to determine the original function of vessels and reveal an overall picture about Bylany.

06 MICHELSBERG SETTLEMENT PATTERNS IN HESSIA: SHIFTING SEDENTISM AND AGROPASTORALISM

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Keywords: Shifting Sedentism, Michelsberg
Presentation Preference: Oral

The archaeological record for the settlement pattern of the Young Neolithic Michelsberg culture in Hessia is confusing: on the one hand we have evidence for interspersed open sites, often only documented through pit features and utterly rarely through house remains. On the other hand we have remains of enclosures and hilltop sites of sometimes enormous dimensions, like Kapellenberg or Schierstein. These two seemingly opposing extremes have to be brought into a fitting scheme which explains the Young Neolithic settlement pattern in Hessia and possibly in other areas of the developed Michelsberg culture.

In order to solve this riddle, we apply the economic concept of agropastoralism and the settlement concept of shifting sedentism by making use of possible ethnographic parallels from Southern and Eastern Africa.

07 A MULTI-PROXY APPROACH TO DIET AND ANIMAL MANAGEMENT IN THE NEOLITHIC OF NORTHERN GREECE

Author: Dr Whelton, Helen - University of Bristol (Presenting author)
Co-Author: Prof Halstead, Paul - University of Sheffield; Dr Triantaphyllou, Sevi - Aristotle University of Thessaloniki; Dr Isaakidou, Valasia - University of Oxford; Prof Kotsakis, Kostas - Aristotle University of Thessaloniki; Dr Urem-Kotsou, Dushka - Democritus University of Thrace; Prof Evershed, Richard - University of Bristol
Keywords: Multi-proxy, ORA, Zooarchaeological
Presentation Preference: Oral

Palaeodietary and zooarchaeological proxies are widely used to investigate the interaction of humans with their animals and provide insights into economy, diet and herd management practices. Complementary multi-disciplinary techniques are used to bring together multiple lines of evidence to refine interpretations regarding the processing and consumption of commodities. Here, biomolecular and isotopic analyses of lipid residues from ceramic vessels are combined with zooarchaeological studies and stable isotope analyses of human and animal skeletal collagen δ13C and δ15N values from Neolithic northern Greece. Lipid residues absorbed in pottery vessels provide a direct reflection of

contents of the vessel during use. Fatty acid δ13C values are a reflection of the isotopic composition of diet and an indication of the environment from which they derived. Bulk stable isotope δ13C and δ15N values from skeletal collagen represent a long-term dietary average.

Results demonstrate the fatty acid δ13C values of lipid residues are consistent with the high abundance of pig and sheep/goat in faunal assemblages. Dairy farming does not appear to have been intensively practised. Animal bulk collagen δ13C and δ15N values reflect a largely terrestrial diet, with the exception of cattle, where relatively enriched δ13C values infer consumption of C4 or drought-stressed C3 vegetation. This suggests different animal management strategies for cattle, sheep/goat and pigs were practised. Enriched δ13C values observed in cattle are not reflected in δ13C values of ruminant adipose lipids in the pottery or human collagen δ13C values inferring they were not consumed on a regular basis.

Differences in animal management are revealed through dietary isotopic variation of ruminant domesticates. Significantly, this would not be apparent in regions where such isotopic differences do not exist. Integration of zooarchaeological and lipid analyses has refined interpretations regarding the species being processed and consumed, revealing the cultural and economic importance of different animals.

08 LINEARBANDKERAMIK ANIMAL HUSBANDRY: AN INSIGHT FROM AGE-AT-DEATH ANALYSIS OF CATTLE, SHEEP, GOATS AND PIGS.

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Keywords: Domesticates, Husbandry, LBK
Presentation Preference: Oral

Cattle have long been considered to be the primary source of meat and perhaps milk for the Linearbandkeramik (LBK) communities. Other domesticated animals existed at different ratios in relation to cattle across central Europe. These animals would have provided early Neolithic populations with meat, milk, hair and hides and their contribution to LBK subsistence economies is often over looked. In the Mediterranean area for example, sheep and goats have been found to have been important for supporting early Neolithic communities, particularly for milk production(1). What was the relevance of dairy products in the economy of LBK communities in northern regions? What was their contribution compared to other animal derived fat components? Could an increased pig husbandry such as observed on some LBK sites be explained by a need for fat? The presentation will explore these issues by analysing age-at-death analysis based on dental eruption, wear and replacement, and bone fusion. These methodologies are hampered by difficulties in species differentiation between sheep and goat and wild and domesticated pig, which will be discussed and considered. Together with statistical analysis, we aim to provide a holistic assessment of the role of domesticates and their products in Linearbandkeramik communities during the 6th to 5th millennium BC.

1. Debono Spiteri C, Gillis RE, Roffet-Salque M, Castells Navarro L, Guilaine J, Manen C, et al. Regional asynchronicity in dairy production and processing in early farming communities of the northern Mediterranean. Proc Natl Acad Sci U S A. 2016;113(48):13594-9.

09 EARLY DAIRYING IN THE ROMANIAN NEOLITHIC? LIPID RESIDUE ANALYSIS OF VESSELS FROM RADOVANU-LA MUSCALU AND ŞOIMUŞ-LA AVICOLA (5TH MILLENNIUM BC)

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Keywords: Neolithic, dairying, Romania
Presentation Preference: Oral

In recent decades, there has been an increased interest within pottery studies in linking vessel form and function. In this field, residue analyses are of great importance in establishing not only vessel function, but also provide greater understanding of past diets and foodways. Following Sherratt's "secondary products revolution," there has been particular interest in detecting dairying among early agricultral societies. In this study, we explore the potential for signficant use of milk products by Romanian Neolithic groups, prior to the so-called "revolution" of the Late Copper Age. The large number of cattle and caprine bones at these sites suggests the possibility of dairying; here we directly assess milk use through lipid residue analysis of ceramic vessels.
We selected 20 pottery samples from two neolithic sites in Romania, Radovanu-La Muscalu (late Boian tradition, southern Romania) and Şoimuş-La Avicola (Ferma 2) (Turdaş tradition, western Romania), both of which date to the first half of the 5th Millennium BC. The samples were carefully chosen from secure contexts (pits, dwellings) and represent different vessel types, inlcuding so-called strainers or sieve vessels, bowls, and cooking pots. To date, this project is only study of this type for the Romanian Neolithic and, more importantly, serves to clarify larger issues surrounding the antiquity of European dairying and its importance among these early agricultural communites.

10 LONG HOUSES - BIG HERDS: LBK CATTLE HERDING AND ARCHITECTURE

Author: Dr. Strien, Hans-Christoph - Johannes Gutenberg-Universität Mainz (Presenting author)
Keywords: LBK longhouses herds
Presentation Preference: Oral

Interpretation of LBK longhouses is debated since their recognition in the 1930s. A synoptical study of the available isotopic, faunal and botanical data shows positive correlations between house surfaces and
- consumption of animal protein by the inhabitants
- percentage of domestic ruminants in the faunal assemblages
- percentage of charcoals from species useable for leave fodder

The interpretation presented is a correlation between herd size and house surface. The reason is probably not a function of parts of the house as stable but as barn, as winter fodder produced by harvesting leaved branches needs large storage capacities.
In this light, the invention of the LBK longhouse may be interpreted as necessary part of the emergence of a mainly cattle-based stock breeding in the deciduous forests of Central Europe

11 NEOLITHIC CATTLE IN ROMANIA

Author: Dr. Balasescu, Adrian - National Museum of Romanian History (Presenting author)
Keywords: Neolithic, Romania, Cattle
Presentation Preference: Poster

Our presentation will review the evolution of animal paleoeconomy and the role of the cattle (Bos taurus) in Romania Neolithic (c. 6200-5000 BC) based on studies of archaeozoology.
Despite the rather limited number of archaeozoological studies concerning Romania (about 6), we see that Early Neolithic period (c. 6200-6000 BC) is characterized by a predominance of caprines (sheep/goat) and cattle depending on the terrestrial environment. After the arrival of the first Neolithic farmers in the target area, between 6000-5000 BC we observed that the livestock activity is based primarily on cattle, which is predominant in most faunal samples studied (30 sites).
The study of the ages of slaughtering of cattle shows that in the Early Neolithic we do not have the indices that suggest milk exploitation, but rather to increase production of meat consumption preferring animals aged between 1 and 4 years old. After 5500 BC only in a few Neolithic sites, it can be observed an increased number of animals slaughtered between 6 and 12 months, which suggest a slaughter post-lactation and implicitly the milk production in those communities. In addition to that in most Neolithic sites are seen a larger number of the adult female animals that are producing milk.
We conclude that in Romania the first exploitation of dairy cattle starts around 5500 BC and this is confirmed by the study of lipids ceramics from Magura site (Evershed et al., Nature, 2008).
This work was performed through the Partnerships in Priority Areas Program - PN II, developed with the support of MEN - UEFISCDI, project no. PN-II-PT-PCCA-2013-4-2302 and PN-II-RU-TE-2014-4-0519.

12 THE IMPACT OF DAIRYING ADOPTION AND INTENSIFICATION ON BONE FAT EXPLOITATION IN THE LINEARBANDKERAMIK CULTURE

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Keywords: Marrow, Dairying, Neolithic
Presentation Preference: Oral

The adoption and perhaps intensification of dairying in Neolithic central Europe must have had a profound effect on the diets of early farmers. Where ruminant milk was available it brought new opportunities for consumption of protein and fat, with dairy products such as cheese reducing lactose content and increasing fat storability. Fat is an important dietary component, particularly in societies with limited carbohydrate consumption or those under seasonal subsistence stress. In such societies within-bone fats are often utilised through bone marrow extraction and bone grease rendering, practices detectable in the archaeological record through high levels of fresh (perimortem) fracture and fragmentation of cancellous animal bone. This paper analyses the relationship between bone fat use and milk fat availability on Linearbandkeramik (LBK) culture sites, contrasting evidence for dairy economies using ruminant herd structure and lipid residue analysis with evidence of intensive bone fat use. The results show that the time-consuming rendering of bone grease was not often practised on LBK sites, likely due to the availability of carbohydrate-rich domestic crops. Bone marrow was much more widely utilised in Neolithic diets, but on sites where dairy fat may have been readily available evidence for intensive marrowfat exploitation is reduced.

13 MEAT, MILK AND PRESTIGE. THE USE OF CATTLE AND ITS PRODUCTS IN THE EARLY NEOLITHIC OF THE POLISH LOWLANDS

Author: Prof Marciniak, Arkadiusz - Institute of Prehistory, Adam Mickiewicz University, Poznań, Poland.
Co-Author: Prof Evershed, Richard P. - Organic Geochemistry Unit, School of Chemistry, University of Bristol, Bristol, UK (Presenting author)
Keywords: Milk, meat, prestige
Presentation Preference: Oral

Cattle was the most important domesticated animal in the early Neolithic of the Polish lowlands. Thanks to recent methodological developments in archaeology, including application of stable isotopes, aDNA, lipids, the advancements in faunal studies, including age-at-death profiles, and the deepened theoretical reflection on human-animal relations, it is now possible to reliably reconstruct major facets of cattle husbandry practices as well as the forms of exploitation and use of the live animals and their products. The paper aims to address the latter aspect by referring to the newest studies in the Neolithic scholarship.
The objectives of the paper are twofold. Firstly, it intends to discuss the role and significance of cattle in different domains of the lives of early Neolithic farmers in the Polish lowlands, including mastering the art of herding practice. Secondly, it aims to scrutinize a significance of different cattle products such as the character and scale of beef

consumption and introduction of dairying. Both the position and role of cattle and significance of its products will be scrutinized as constituent elements of the social fabric of live of the early farmers from the Polish lowlands.

14 CASH COWS: THE INTRODUCTION OF DOMESTIC LIVESTOCK BEYOND THE MEDITERRANEAN ZONE IN THE SIXTH MILLENNIUM BC

Author: Mr Ethier, Jonathan - Institut für Ur- und Frühgeschichte und Vorderasiatische Archâologie, Universität Heidelberg (Presenting author)
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Keywords: Balkans, Husbandry, Lipids
Presentation Preference: Oral

The wild progenitors of the main domestic animals in the Old World are endemic to regions with Mediterranean climate. Since their domestication, sheep, goats, pigs and cattle have been introduced to an enormous variety of environments, many of which would not have been tolerated by their wild ancestors. The first steps in this process can be traced back to the farming pioneers of the Balkans, who penetrated beyond the borders of the Mediterranean zone of Europe in the early centuries of the sixth millennium BC. Herein, we combine organic residue analysis of ceramic vessels with faunal data on taxonomic composition to investigate changes in livestock exploitation with its northward dispersal into the Balkans. Our results show notable differences in the scale of dairying between the Aegean and the southern Balkans, on one hand, and the northern Balkans and the Hungarian Plain on the other hand. They suggest that dairying and cattle herding were instrumental to the spread of the Mediterranean livestock system into the temperate areas of the Balkans, and from there across the entire European continent.

15 ANIMAL HUSBANDRY ON THE POLISH TERRITORY IN THE EARLY NEOLITHIC

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Keywords: LBK, subistence strategies
Presentation Preference: Oral

Studies on animal husbandry are the basis for the knowledge on economy of past human societies. This is especially important for the studies of the LBK (Linearbandkeramik) culture, occurred in Central Europe during the 6th millennium BC. From the territory of Poland the largest LBK bone assemblages are known from single sites located in loess landscapes of Lesser Poland as well as Polish Lowlands where fertile land of Kuyavia and Chełmno Land were inhabited. This situation offers an exclusive example for study of the first farmers adaptation to different regional conditions. Animal assemblages known from Lesser Poland in comparison with Lowlands vary, but the differences are visible mainly in the share of smaller ruminants (sheep, goats and pigs) as well as wild animals. Cattle dominates at all areas, and we can state that this specimens played an important role in animal husbandry economy, what was confirmed at the whole territory of Poland. In present study, we would like to discuss the results of our archaeozoological research which will be used for wider discussion of the early Neolithic subsistence strategies on the territory of Poland and Central Europe.

16 TEMPORAL EVOLUTION OF DIETARY PRACTICES AND POTTERY USE IN THE LOWER ALSACE DURING THE NEOLITHIC SEEN THROUGH LIPID RESIDUE ANALYSIS.

Author: Prof Evershed, Richard P. - University of Bristol
Co-Author: Miss Casanova, Emmanuelle - University of Bristol (Presenting author); Dr Roffet-Salque, Mélanie - University of Bristol
Keywords: diet, pottery, Neolithic
Presentation Preference: Oral

The lower Alsace region contains/presents ca. 100 archaeological sites from the early Neolithic Linearbandkeramik (LBK) culture and the middle Neolithic Hinkelstein, Roessen and Grossgartach cultures. Pottery assemblages of those cultures have been extensively studied by ceramic specialists and a really tight seriation study established. A recent dating program using pottery seriation in a Bayesian framework revealed a discontinuity in the occupation of the region between the end of the LBK and the beginning of the Hinkelstein culture. The LBK culture represents the first farming communities in the region, with faunal spectra dominated by domesticated animal remains. The use of milk products could have started during the LBK4 however aDNA studies failed revealing the -13,910*T allele responsible for the digestion of lactose from milk by adults in this culture. Lipid residue analysis of pottery vessels can provide direct evidence for milk exploitation by early farmers. Evidence for cheese processing has for instance been found in ceramic sieve vessels at the LBK site of Ludwinowo (Poland).
In this study, lipid residues were successfully extracted and identified from 480 pottery vessels from the lower Alsace region. The LBK sites presenting settlements from the early to late LBK (Bischoffsheim "AFUA du stade") and from late to final LBK (Rosheim "Ste-Odile, Rittergass") have been selected. Dairying products timidly appear during the late phase of LBK at the site of Bischoffsheim but are absent from the site of Rosheim. Lipid residue analysis also highlighted the specialisation of vessel with the use of undecorated potsherds as cooking pots and decorated vessel as "tableware" during the LBK. Further sites to be analysed are the middle Neolithic sites of Rosheim "Laser", "Mittelweg" and "Sandgrube" with settlements of the Roessen and Grossgartach cultures.

17 DIVERSITY OF CATTLE EXPLOITATION IN THE LINEARBANDKERAMIK CULTURE

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Keywords: Cattle Exploitation, Archaeozoology,
Presentation Preference: Oral

For a long time, European research presented the agro-pastoral system of Early Neolithic Europe (Linear Pottery Culture) as a cattle dominated husbandry, to which were associated small ruminants and suinae. In our contribution, we propose to reevaluate the role of cattle, in the view of the diversity of purposes revealed by the extensive studies of well-documented sites. Beyond the variability among the sites, the faunal assemblages point to differences according to the discovery context; flanking pits, isolated pits or ditches. It will be necessary to examine the causes and significance of this variability.

406 DIGGING FOR HISTORICAL PERSONALITIES. IDENTIFICATION OF HUMAN REMAINS – MYTH OR REALITY?

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Engovatova, Asya (Russia) - Institute of Archaeology Russian Academy of Sciences
Co-Author(s): Belyaev, Leonid (Russia) - Institute of Archaeology Russian Academy of SciencesDepaepe, Pascal (France) - INRAPMednikova, Maria (Russia) - Institute of Archaeology Russian Academy of Sciences
Keywords: Historical identification, heritage management
Presentation Preference: Session with pre-circulated papers

What can the theory and practice of the 'Third Science Revolution' offer this kind of identification?
One of archaeology's most complex issues is verifying the personal data of individuals whose remains are unearthed during excavations. Problems of personal identification have far-reaching consequences not only for scholars, but for society as a whole – so there is little space for error. Just decades ago, archaeologists based their work on historical and archaeological sources when making such identifications. But now, in the so-called 'Third Science Revolution', a far wider range of interdisciplinary methodology is deployed to address this issue. Researchers call upon DNA analysis, strontium isotopes, paleo-anthrolopology, alongside the use of forensic approaches such as correlating facial images from the individual's own lifetime with cranial data from excavations.
Our workshop will discuss examples of 'successful' individual verification attempts on historic personalities over recent years. Yet just as valuable is the issue of revisiting mistaken identifications made by archaeologists, and assessment of the reasons behind such errors. We plan outlining a scheme of proven methods which aid in verifying the identification. There are serious issues concerning how the practice of Heritage Management can succeed in accessing public resources (the assignment of staff and budgets to such investigations) to make such findings available to the TV, press, and society at large?

01 BURIAL IDENTIFICATION AT THE MOSCOW DIVINITY ACADEMY CEMETERY, AT RUSSIA'S OLDEST MONASTERY – THE TRINITY ST SERGIUS LAVRA.

Author: Dr. Engovatova, Asya - Institute of Archaeology of Russian Academy of Sciences (Presenting author)
Keywords: Moscow Divinity Academy
Presentation Preference: Oral

RAS Institute of Archaeology researched Russia's oldest monastery – the Trinity St Sergius Lavra.
The Moscow Divinity Academy of the Russian Orthodox Church – founded in 1685, Russia's oldest institute of learning – moved there in 1814.
From 1871 a special area of the Academy's gardens served as a cemetery for Academy members, until 1916. After 1917 the Academy was closed, its cemetery rased, the memorials destroyed.
The probable cemetery site was investigated in 2014 - aiming to establish its location, degree of preservation, and the sites of specific graves for their identification.
Work began with archival research, burial lists, and preliminary mapping of burial locations. Geo-radar searches revealed three rows – presumably graves, yet conflicting with archive information.
Excavations located gravestone remains, and grave outlines. Three tombs were identified from gravestones – two Academy Rectors and a Distinguished Professor. Identifying other tombs required opening them. 37 tombs were researched.
Analysis revealed the the deceased's high social status, with floridly-decorated tombstones, contrasted with simple tombs. Grave goods and shrouds delineated three groups – students, teachers, and clergymen.
Anthropologists and coroners worked on identification directly at gravesides. 3D scans and photogrammetry work produced virtual models from the remains. Skull analysis enabled identification of five Academy professors.
Cross-disciplinary archaeology, anthropology, forensics, geo-radar and study of historic items made grave identification of 12 professors and rectors, 3 students, and 2 Academy staff possible. They aided preliminary conclusions on other graves where no direct identification has yet proved possible. 24 graphic portraits of the deceased were compiled.

02 THE « COUVENT DES JACOBINS » EXCAVATION (RENNES, BRITTANY): IDENTIFICATION OF THE LOUISE DE QUENGO'S GRAVE.

Author: Mrs Duchesne, Sylvie - Inrap (Presenting author)
Co-Author: Dr Depaepe, Pascal - Inrap; CNRS UMR 7194
Keywords: Identification, Grave
Presentation Preference: Oral

Nowadays it's quite rare to identify dead people in archaeological context. It's mainly thanks to historical clues that the archaeologists are able to give a body a name.
The archaeological operation of the Jacobins Monastery in Rennes (Brittany) was the opportunity to excavate numerous graves, sometimes of important people whose identity is known. In this paper we present one of them, the grave of Mrs Louise de Quengo, died 10th of March 1656.

03 THE LOST BRANCH OF THE TSARS' HOUSE: THE CEMETERY OF THE ROMANOVS AT THE NEW MONASTERY OF THE SAVIOR (MOSCOW)

Author: Dr. Belyaev, Leonid - Institute of Archaeology of Russian Academy of Sciences
Co-Author: Yolkina, Irina - Institute of Archaeology of Russian Academy of Sciences (Presenting author)
Keywords: Archaeology of Romanovs
Presentation Preference: Oral

The family name of the House of Romanov (1613-1917) took its origin from the boyar Roman Zacharjin-Koshkin (died in 1543). His younger son, Nikita, became a father of a dozen of children, surnamed as Nikitichi, or Romanovs, after the grandfather. The oldest one, Feodor Nikitich Romanov, was the father of Michail Romanov, the elected (1613) founder of the dynasty. But the fate of Nikitichi was a tragic one. Under the Tsar Boris Godunov they were repressed and the Boyar Branch of Romanovs disappeared soon. Their mortal remains were buried outside the family burial vault of their ancestors. Later on the funerary chapel over their tombs was erected. In the Soviet period the grave stones of Nikitichi dissapeared, but the chapel itself did survive.
In the 2010-s we studied the compartment of the church, associated with the commemoration of Nikita Romanov's family. As a result, four limestone sarcophagi were discovered and one individual burial vault. The sarcophagi were inscribed with the names of the kids of Prince Jacob Cherkassky, died in the middle of the 17th c. Inside the individual tomb of stone was buried a woman, but four male skeletons were placed into the same tomb later on. The slab over the tomb called its owner «Marpha, daughter of Nikita Romanov, wife of the Prince Boris Cherkassky». Marpha was a very much esteemed lady – under the repressions she succeeded to save the life of her nephew, further Tsar Michail, then a kid.
The results of this case study in archaeology and anthropology are the subject of two papers, presented at the session.

04 THE LOST BRANCH OF THE TSARS' HOUSE: THE CEMETERY OF THE ROMANOVS AT THE NEW MONASTERY OF THE SAVIOR (MOSCOW)

Author: Dr Belyaev, Leonid - Institute of Archaeology Russian Academy of Sciences
Co-Author: Mrs Elkina, irina - Institute of Archaeology Russian Academy of Sciences (Presenting author)
Keywords: Archaeology of Romanovs
Presentation Preference: Oral

Content
The family name of the House of Romanov (1613-1917) took its origin from the boyar Roman Zacharjin-Koshkin (died in 1543). His younger son, Nikita, became a father of a dozen of children, surnamed as Nikitichi, or Romanovs, after the grandfather. The oldest one, Feodor Nikitich Romanov, was the father of Michail Romanov, the elected (1613) founder of the dynasty. But the fate of Nikitichi was a tragic one. Under the Tsar Boris Godunov they were repressed and the Boyar Branch of Romanovs disappeared soon. Their mortal remains were buried outside the family burial vault of their ancestors. Later on the funerary chapel over their tombs was erected. In the Soviet period the grave stones of Nikitichi dissapeared, but the chapel itself did survive.
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The results of this case study in archaeology and anthropology are the subject of two papers, presented at the session.

05 BIOARCHAEOLOGICAL APPROACH IN IDENTIFICATION OF HIGH STATUS FEMALE BURIAL OF THE 17TH CENTURY: GENDER ASPECT

Author: Prof. Dr. Mednikova, Maria - Institute of Archaeology Russian Academy of Sciences (Presenting author)
Keywords: bioarchaeology, skeletal expertise
Presentation Preference: Oral

Excavations by the Institute of archaeology of RAS in Moscow (Novospassky monastery) recently discovered a collective burial in stone sarcophagus. One of skeletons belonged to a woman. Methods of bioarchaeological investigation of remains included visual description, measurements, as well the use of some modern techniques like microtomography, non-destructive X-ray microscopy, microfocus X-ray, fluorescent microscopy, isotopic analysis of diet, strontium isotopic analysis etc. Archaeological context indicates the date of burial as the end of the 16th-the beginning of 17th centuries. Based on bioarchaeological and palaeopathological criteria, the life style of the woman could be described. Her age was detected by various methods as 40-50 years at death. Her estimated stature was low even for 17th century (about 146 cm). Many so called Harris lines were found on X-ray films of her tubular bones, indicating numerous growth disruptions in her childhood as a hallmark of physiological stress. But data of isotopic analysis of diet revealed high quality milk and meat consumption during her adult life. As well, the absence of prominent pathological conditions in her dental and skeletal system indicated good health. Altogether, these results and archaeological context of burial indicated the high social status. Moreover, data of expertise supported the belonging of woman to powerful and rich clan of boyars. She could be one of the closest relatives of the first tsar of Romanov dynasty. From this point, reconstruction of life quality and health condition opens consideration of women place in aristocratic Russian families. The data from earlier excavations by Institute of archaeology of high status graves of similar age in Trinity Lavra of St.Sergius can be used for gender aspect consideration too.
The study was provided with financial support of the grant of Russian Humanitarian Science Foundation (now Russian Foundation for Basic Research) № 16-01-00081

06 IDENTIFICATION OF ARCHBISHOP NIKON, DURING ARCHAEOLOGY AT THE HOLY SPIRIT'S DESCENT CHURCH OF TRINITY ST SERGIUS LAVRA.

Author: Dr. Engovatova, Asya - Institute of Archaeology of Russian Academy of Sciences (Presenting author)
Co-Author: Vasileva, Elena - Institute of Archaeology of Russian Academy of Sciences; Dr. Dobrovolskaya, Maria - Institute of Archaeology of Russian Academy of Sciences; Kurystsin, Maxim - Institute of Archaeology of Russian Academy of Sciences
Keywords: St Sergius Lavra
Presentation Preference: Oral

Archbishop Nikon (1851-1918) is famed for his clerical work, writings, publishing, as an Archbishop – a Synod and State Council member. Author of the definitive biography of St Sergey of Radonezh, and famed for his dispute at Athos.
Nikon took an anti-liberal stand in 1910, and called the Revolution of 1917 'the work of Satan' – bringing him under intense criticism.
Nikon undertook various pre-1917 work at the Lavra. After the Revolution his Lavra work continued, and died there in December 1918, being buried in the cemetery.
Rival versions of his death circulated – either natural, or that Revolutionaries beat, killed, or beheaded him. Proof remained impossible until recently. Following the Revolution the cemetery was rased and tombstones removed - information about his grave was lost, other than being east of Divinity Church.
Improvement works in 2009 enabled archaeological investigation.
Archives confirm that Nikon's tomb lies to the west of the Mukhanov family vault, below the fifth window of the (surviving) Predtechinsky monastic cells. The search area for his grave was determined for archaeologists. Stone foundations of the Mukhanov vault were found, with their sarcophagi. Soil slices showed a grave outline – presumably Nikon's. The grave revealed remains of a 60-70-year-old male, which were forensically and anthropologically studied. This age matches that of the archbishop at his date of death. Comparative photo-analysis of surviving pictures of Nikon, along with skull analysis, indicates that the remains unearthed are most likely those of Archbishop Nikon. No sign of beatings or bone-breakages was found – confirming the version of natural death. Grave-based evidence suggests that Nikon's burial took place in secrecy, hurriedly, and in mid-winter.

07 SLEEPY KNIGHT: THE LAST DAYS OF ONE OF THE RUSSIAN PRINCE

Author: PhD Reshetova, Irina - Institute of Archaeology Russian Academy of Sciences (Presenting author)
Keywords: historical identification, Shemyaka
Presentation Preference: Oral

The monasteries of Veliky Novgorod (Russia) have always served as tombs for representatives of the Russian religious and social elite. There were found human remains in the study of funerary structures of the St. Sophia Cathedral in Veliky Novgorod. These remains were investigated by V. Ginzburg in 1939 and S. Nikitin in 1987 and were identified as belonging to the Grand Prince Dmitry Shemyaka (who lived at the beginning of the 15th century-1453).

In 2016, the study of the remains was continued. Methods of IR spectroscopy, Raman spectroscopy, X-ray fluorescence analysis, electron microscopy, and stable isotope analysis were used together with standard anthropological techniques.

Remains belonged to a male of 45-50 years old, of strong constitution, about 168 cm tall. The body of the individual is completely mummified. The skull is partially skeletonized.

Keratine remains were preserved on the knee joint surface on the tibia. The traces of the textile were discovered on the knee joints (mostly to the left), as well as on the left humerus and forearm. The textile has a simple linen weave.

A trace from the healed compression fracture is on the left parietal bone in the area adjacent to the sagittal suture. The Prince Dmitry was poisoned according to historical data. This testimony was important to identify the remains. Elemental analysis detected arsenic compounds in keratin remains (hair, nail). The condition of soft tissues indicates that the individual was severely dehydrated. This circumstance also confirms the historical source about poisoning

Fragments of hair and fingernail were examined along the growth lines. Results of our study allowed to restore the last days of the Prince and to confirm historical evidence about the poisoning.

08 THE REMAINS OF THE SOLDIERS OF THE GREAT WAR ON THE WESTERN FRONT. 700000 DISAPPEARED, THE PROBLEM OF THEIR IDENTIFICATION.

Author: Mr Prilaux, Gilles - Inrap; CNRS UMR 8164 (Presenting author)
Co-Author: Doctor/Phd Depaepe, Pascal - Inrap; CNRS UMR 7194
Keywords: WWI, Identification, Graves
Presentation Preference: Oral

Ten million deaths in four years of fighting are the direct result of the first industrial war in our history. The battlefield was ravaged by artillery shelling and more than a billion shells fired. At the end of the fighting bodies of 700 000 soldiers have never been found and are still buried in the countryside under agricultural land.

-How can we explain the disappearance of so many men?
-What remains today of these disappeared?
-How did the fighters organize the management of mass death?

Since the beginning of 1990 and the development in France of preventive archaeology, the archaeologists of Inrap discover regularly bodies of soldiers of the Great War.
With almost 30 years of experience, it is now possible to offer an assessment of these discoveries.

The purpose of this presentation is to present the main scenarios in funerary contexts.

Indeed, the situations are very varied:

-Fragments of legs of arms of heads lost on the battlefield
-Provisional burials
-Burial not regulated
-Cenotaph
-Cemeteries displaced
-Mass graves

To conclude, I will present some examples of identification of missing soldiers and so the possibilities allowed to their families to give them a last tribute almost 100 years later.
The remains of the Great War represent a special archaeological level that allowed French researchers to participate, despite themselves, of the duty of memory.

09 THE LAST ARCHIMANDRITES OF SOLOVETSKY MONASTERY: THE IDENTIFICATION OF HISTORICAL CHARACTERS

Author: Dr. Shvedchikova, Tatiana - Institute of Archaeology Russian Academy of Sciences (Presenting author)
Co-Author: Dr. Khartanovich, Valery - Peter the Great Museum of Anthropology and Ethnography Russian Academy of Sciences; Mr. Galeev, Ravil - Institute of Ethnology and Anthropology Russian Academy of Sciences
Keywords: Bioarchaeology, identification
Presentation Preference: Oral

The Solovetsky Monastery located on the archipelago in White was founded in 15th century and became the most prominent and rich monastery in pre-Peter times. Than it became the first re-education camp during the Soviet times and one of the first sites included to the UNESCO World Heritage Sites in Russia. The salvage excavations in 2013-2014 due to the reconstruction process revealed the remains of the presumably four priors of Solovetsky monastery buried during the period from 1865 to 1921. The main identification process faced several problems among which were the difficulty of superimposition expertise due to the lack of image materials and peculiarity of monk's hair dressing. One of the skulls was absent because of robbery activity. Thus the possible pathological manifestation, stress markers were studied and compared to the biographies of priors. One of the skeletons demonstrated the acute inflectional process, another one pose the question of differential diagnosis between cryptococcosis and cancer. As a result we can conclude that remains belong to archimandrites Ioanniki, Porphyrius, Varlaam and Theophan. The palaepathological data in our case could serve as an additional information while the identification process.

10 IDENTIFYING THE REMAINS OF NAPOLEONIC WAR HEROES. GENERAL YERMOLOV.

Author: Vasileva, Elena - Institute of Archaeology of Russian Academy of Sciences (Presenting author)
Co-Author: Dr. Engovatova, Asya - Institute of Archaeology of Russian Academy of Sciences; Prof. D.S.C., Ph.D. Mednikova, Maria - Institute of Archaeology of Russian Academy of Sciences; Radjush, Oleg - Institute of Archaeology of Russian Academy of Sciences; Ph. D. Shvedchikova, Tatyana - Institute of Archaeology of Russian Academy of Sciences; Reshetova, Irina - Institute of Archaeology of Russian Academy of Sciences
Keywords: General Alexei Yermolov
Presentation Preference: Oral

General Alexei Yermolov was a legendary Russian General of both the Infantry and Artillery, a veteran of the Napoleonic Wars and Caucasus Campaign (Commander of the Georgian Division). Buried in 1861 at his family vault, on the right of the Holy Trinity Church at Orel. His father, and later, his son, were also buried there.
Over 2012-2013 studies established the Yermolov vault's condition – how many burials it contains, and identifying the remains.
Identification issues arise due to all the burials being male, blood relations, and of similar age at death. Furthermore the vault had been looted - then filled with builder's debris containing mixed rubble, uniform fragments, funerary regalia and human remains. Rumours ran that the General's remains had been burgled.
Distance photography of the vault preserved its situation and enabled 3D modelling.
Excavation revealed that vault looting took place in 1941-43, again in the late 1970s, with final attempts in the period after 2004.
Regimental buttons of different battalions, found on scraps of uniform, enable accurate identification of those buried as General Yermolov, his father, and his son.
Three-dimensional anthropological scanning of the skulls, with geometric morphometrics and radio-microscopy, confirmed the presence of three discrete individuals.
Morphometrics highlighted their close genetic relation, providing objective evidence of the similarities and differences over three generations of Yermolov-dynasty men.
Paleogenetics confirmed the direct line of succession between the three men. MtDNA analysis of the son's remains showed the presence of the H2a1 haplogroup – a typical genetic component of people hailing from Dagestan.
The research confirmed the presence of three related male skeletons in the vault, and that the remains of Napoleonic War veteran, General Yermolov, had not been looted.

11 NICKOLAY VASILIEVICH GOGOL AT THE BURIAL GROUND OF SAINT DANIEL MONASTERY IN MOSCOW: LEGENDS AND ARCHAEOLOGY

Author: Dr. Belyaev, Leonid - Institute of Archaeology of Russian Academy of Sciences (Presenting author)
Keywords: Archaeology of Gogol
Presentation Preference: Oral

The death and the burial of the great writer Gogol at the mid of the 19th century are enveloped in the countless urban legends of Moscow. There are two of them: one is associated with the burial of him at the lethargy, and the second – with the discovery of his remains without a head. The first is fully untrue, but the second has its roots in the reality.
Gogol was buried at the cemetery of Saint Daniel monastery in 1852, but in 1930 his remnants were dug out and transmitted to the different burial ground, to the convent of Novodevichiy. Saint Daniel monastery's cemetery was demolished under the Soviet regime and the spot of the Gogol's tomb was considered to be perished. We launched the program of the electronic reconstruction of the graveyard. As a result, the first resting place of the writer was determined. And archaeological excavations at the spot (2007) discovered not two, but three stages in the history of the grave: the moment of burial (1852), remodeling of the monument and the grave itself (1909) and the transfer of the remnants (1930). Also, the lost part of Gogols's skeleton was found and anthropologically studied. It was proved that the scull of the writer disappeared, probably, in the 1909. As a result, we got the full picture of the tomb history as well as the sources of the legends.

12 THE LAST ATAMAN OF THE ZAPOROZHYE SICH: HISTORICAL SOURCES AND ANTHROPOLOGICAL EXPERTISE

Author: Dr Dobrovolskaya, Maria - Institute of Archaeology Russian Academy of Sciences (Presenting author)
Co-Author: PhD Reshetova, Irina - Institute of Archaeology Russian Academy of Sciences
Keywords: historical identification, Kalnyshevsky
Presentation Preference: Oral

Petr Kalnyshevsky (1690 - 1803) was the last Kosh ataman of Zaporozhye Sich. At present, this historical personality is of great interest in the civil society of Russia and Ukraine. Catherine the Great liquidated Sich and Peter Kalnyshevsky was sentenced to death. Thanks to the intercession of the Prince Potemkin, the execution was changed to life imprisonment in the Solovetsky Monastery. As well know, the abbey is located on one of the White Sea islands at the latitude of the Arctic Circle. On written sources, the ataman was imprisoned for 28 years. Hard circumstances should have affected his health. According to historical data, Petr Kalnyshevsky's age exceeded 100 years.
In August 2015, excavations were carried out in the Cathedral of the Solovki Monastery. Based on the research performed by the archaeologist V.A. Burov, it was the burial place of Peter Kalnyshevsky.
Identification of human remains from this burial was the purpose of our research. The study was based on comparison with two types of sources:
lifetime portraits and iconographic images of P.I. Kalnyshevsky and
historical data about his age. Good preservation of skeletal remains made it possible to determine the biological age of the individual. The condition of cranial sutures, the dental system, joints, and the spine are typical for the individual for about 80 years. Traces of chronic diseases, starvation, cold stress, on the skeleton are not found. The histological structure of the femur has no manifestations of osteoporosis. The propotions of the face from the portraits and proportion of the facial skull of the individual from the grave are similar. Based on these factors, we made the assumption that the remains of Peter Kalnyshevsky are buried in the grave. Obviously, the conditions of imprisonment ataman were very comfortable. Perhaps, the date of his birth is not true.

13 THE CEMETERY OF THE NOVODEVICHY CONVENT SETTLEMENT IN MOSCOW: ARCHAEOLOGY, ANTHROPOLOGY AND FACIAL RECONSTRUCTION

Author: Grigorian, Svetlana - Institute of Archaeology of Russian Academy of Sciences (Presenting author)
Co-Author: Rasskazova, Anna - Institute of Ethnology and Anthropology Russian Academy of Science
Keywords: facial reconstruction
Presentation Preference: Oral

In the course of archaeological excavations, conducted in 2012-2015 at the Novodevichy Convent cemetery and at the burial ground of the church of John the Baptist (16th c.) under the direction of Leonid Belyaev, more than three hundreds of graves of the 16th – 17th c. were discovered. All of the skeleton remains (337) were studied anthropologically. Some of them got the personal identification due to the inscriptions at the stone grave slabs (11 stones). Also, all of the grave deposits (personal crosslets, garments, vessels etc.)

were studied by the traditional methods (iconography, statistics etc.). It enabled us to estimate the social level of the deceased and to reconstruct a few of the family groups together with their zones. Then, the general characteristic of gender and age were created and the facial reconstructions were executed of two female and one male.

14 3D GEOMETRICAL MORPHOMETRICS AS A METHOD OF RECOGNIZING BIOLOGICAL RELATIVES IN SYNCHRONOUS COLLECTIVE BURIALS FROM ARCHAEOLOGICAL EXCAVATIONS: CASE STUDY

Author: Tarasova, Anna - Institute of Archaeology Russian Academy of Sciences (Presenting author)
Keywords: geometric morphometrics, identification
Presentation Preference: Oral

Synchronous collective burials may often contain skeletal remains of close relatives. As to the late periods supported by written sources, there exists a problem of identification of historical personalities. This work concerns opportunities of the new approach for identification of people connected by kinship in mass graves and collective burials. A geometric morphometric method based on 'eigensurface analysis' was used for a quantitative analysis of three-dimensional (3D) surfaces of the human skulls from the archaeological excavations. Three-dimensional images of the skulls from excavations of the graves were obtained using a laser scanner Next Engine. Eighteen landmarks were set in Amira programme to delineate and trace out the facial skulls; then the information was processed in MorphoJ programme using Principal Component Analysis.

At the first stage, when working with 28 skulls from excavations of medieval Yaroslavl, we used this technique involving geometric morphometric method to study the degree of morphological diversity within a group of people who had been killed at the same time during a Mongol invasion in 1238 and later buried in the mass graves in the fortified central part of the town. At the second stage, we subsequently used the developed algorithm to analyze the skulls from the excavations of high-status family graves in 16th- and 17th-cent. necropoleis located in Moscow.

The results show that 3D geometrical morphometrics method can be efficiently used for quantitative assessment of the similarity of appearance.

The study was supported by the grant of Russian Humanitarian Science Foundation (now Russian Foundation for Basic Research) No. 16-01-00081

15 PERSPECTIVES OF ARCHAEOGENETIC RESEARCH FOR HISTORICAL IDENTIFICATION. PILOT STUDY.

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Co-Author: Dr. Alborova, Irina - Moscow Institute of physics and technology; Ms. Pimkina, Ekaterina - Central Scientific Research Institute of Epidemiology; Dr. Markelov, Mikhail - Central Scientific Research Institute of Epidemiology; Dr. Khafizov, Kamil - Moscow Institute of physics and technology; Central Scientific Research Institute of Epidemiology; Dr. Mustafin, Kharis - Moscow Institute of physics and technology
Keywords: Archaeogenetics, NGS
Presentation Preference: Oral

The objectives of this study were to develop a protocol for genetic material extraction and sample preparation of aDNA for the next generation sequencing, as well as a software pipeline for the analysis and interpretation of the data, which can be used to determine the historical origin of human being.
The material for the study were the skull teeth found in excavations of burial sites dating from the beginning of the XVIIth century near Radonezh. Important factor determining the choice of these artifacts was the conditions of burial which are typical for the Central Russia. Experience with these remains can be a base for working with other samples from this important historical region. The historical significance of Radonezh connected with the fact that it was a former Novgorod colony where the modern Russian people from Moscow region could originate from. Detailed genotyping of archaeological remains allows a kind of their identification, i.e. determining the genetic connection between the inhabitants of Radonezh XVI-XVII centuries and contemporaries from other regions of Russia.
The sample preparation was carried in a specially designed unit, allows to minimize intra-laboratory contamination, library preparation was conducted with modified adapters which was not allow the formation of adapter-dimeric structures. Sequencing was performed using Illumina MiSeq.
About 22% of the identified by our software reads belonged to organisms from the genus Streptomyces and Bradyrhizobium, which are soil bacteria. Among individual species, the largest coverage (~9% of the identified reads) were taken by a Ralstonia solanacearum, hereinafter Homo sapiens (~5%). It was revealed that only ~1.5% of raw reads were aligned on the human reference genome, but they were mapped to each of the nuclear chromosomes, as well as to the human mtDNA sequence.
Sequencing of the negative control sample showed no contamination at the stage of sample preparation.

16 PORTRAIT OF THE ARTIST. THE IDENTIFICATION AND FACIAL RECONSTRUCTION OF ONE OF THE BURIALS OF THE NEW JERUSALEM MONASTERY

Author: Glazunova, Olga - Institute of Archaeology of Russian Academy of Sciences (Presenting author)
Co-Author: Rasskazova, Anna - Institute of Ethnology and Anthropology Russian Academy of Science
Keywords: Facial reconstruction
Presentation Preference: Oral

Two isolated graves were opened in 2011 while working near the southern wall of the Resurrection Catholicon of the New Jerusalem monastery. The burials were located reasonably far from the monastery cemetery, nearby the Catholicon's southern wall. They were partially covered by the foundations of the Chapel of Franks and the drainage chute of the late 17th century. Somewhat to the west, a stone plate with an epitaph is embedded in the wall of the Catholicon. The text tells us that in February 1665 the hippodyakon Nikita Nikitin was buried here and on the 2nd of July the master Peter Zaborsky was buried. The grave, located closer to the Catholicon, was significantly narrower than the first one (0.6 m in comparison with the 0.7 m of the first grave). It seemed to be squeezed between the first grave and the wall of the Catholicon. We could assume that this grave pit was dug later and the diggers had at their disposal only a very narrow strip of the plot. It was suggested that here Peter Zaborski, the author of the unique tiled decoration of the New Jerusalem monastery, was buried. In the grave was the skeleton of a man aged 35-45 years. A graphic facial reconstruction of Peter Zaborsky was carried out. The character of the face is strongly expressed, horizontal and vertical profiling is emphasized. The face is high and medium wide. The nose is strongly protruding and aquiline.
Unfortunately, the lifetime portraits of the outstanding ceramist Peter Zaborsky did not survive. But as a result of the research, we are able to reconstruct the probable image of the artist.

408 ILLUMINATING THE PAST, ENLIGHTENING THE FUTURE: EXPERIMENTAL ARCHAEOLOGY PIONEERING FOR SOCIETAL DEVELOPMENT?

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Postma, Daniel (Netherlands) - Independent Researcher
Co-Author(s): Duckworth, Chloe (United Kingdom) - Newcastle UniversityTomsons, Artūrs (Latvia) - Latvian National History Museum
Keywords: Experimental archaeology, society, innovation, sustainability
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

With societal impact becoming an increasingly important measure for academic success, many researchers look to contribute to modern society more directly and to greater effect. In humanities, experimental archaeology is particularly well-placed to convey the message of archaeological research to a wider audience. But what is archaeology's contribution to modern society? In this session seek to explore how archaeological skills and insights can be employed on a more substantial and fundamental level, for the benefit of current and future generations.

The field of biomimicry (biomimetics) already draws inspiration from 4 million years of natural evolution, acknowledging the innovative solutions nature found for many challenges analogous to our own. Similarly, ancient societies have dealt with such challenges, coping with environmental disasters, economic crises, cultural integration and political suppression with varying success. Much like biomimicry, Archaeology may employ these past results to inform current innovative design processes.

Seen from this perspective, archaeological experiments may be expanded to include projects that help pioneer an approach as outlined above. For this session we seek papers or posters on projects that are already looking toward generating such an added value to modern society. Which approaches have been experimented with to inform current societal issues by means of archaeology? Do these place an emphasis on education, tourism or other field of occupation? Topics to touch on may include natural resource management, technological innovation, economic stability, social inclusion, cultural adaptation or ideological (religious) tolerance, to name but a few.

01 ARCHAEOLOGICALLY INSPIRED ECO-BUILDING: A PERSPECTIVE FROM THE NETHERLANDS

Author: M.A Postma, Daniël - Archaeo Build / University of Groningen (Presenting author)
Keywords: #Archaeomimicry Eco-building Architecture
Presentation Preference: Oral

Settlement archaeologists have many interests in common with modern eco-builders. Particularly with regard to experimental archaeology, mutual interests exist in natural building material, low-tech tools and techniques, as well as concepts of design, use and maintenance. Can these common grounds support an equally beneficial cooperation between archaeologists and the current building community?
This paper will present examples of small scale building projects recently conducted in the Netherlands. These projects demonstrate the potential interest for modern archaeological architecture for its users, as well as the return that archaeological researchers may expect from this approach.

02 SCUPINI ROMANI - AN ARCHAEOLOGICAL EXPERIMENT WHICH BECAME A LIVE MOVABLE PROJECT

Author: Archaeologist Dimitrovska, Vasilka - HAEMUS - Center for scientific research and promotion of culture (Presenting author)
Keywords: archaeology, education, tourism
Presentation Preference: Oral

To ensure the economic sustainability of plenty of portable exhibits (pottery, clothing, jewelry, knitted items) while creating SCUPINI ROMANI - a brand dedicated to the ancient Roman culture, a lot of different approaches were used. The main aim was to make items which will be usable for people reminding them of a rich cultural heritage from an Ancient Roman period discovered on the territory of the Republic of Macedonia. Inspired by the past, specially designed for this purpose and handmade by artists, artisans and craftsmen all items have multipurpose intentions, like educational tools as well as tourist products as souvenirs.

A dozen of experimental archaeological workshops were organized in an attempt to ensure the inclusive participation of visitors and to inspire them to spend a part of their time there and have an insight of everyday life of Ancient Romans. For that purpose an international festival of ancient Roman culture was created, as well as a lot of following similar events.

The main aim of this paper is to visualize the process and role of experimental archaeology using the live interpretation and living history as a base to interpret an archaeological heritage and an attempt to set up SCUPINI ROMANI as a product available for both, education and tourist industry.

03 DEVELOPING POTTERY MAKING SKILLS IN LOCAL RURAL COMMUNITY OF SULTANA-MALU ROSU

Author: Dr. Theodor Aurelian, Ignat - National History Museum of Romania; Bucharest Municipality Museum (Presenting author)
Co-Author: Dr. Catalin, Lazar - National History Museum of Romania
Keywords: Experimental, local, developement
Presentation Preference: Oral

Experimental archeology is a method that aims to answer specific questions using controlled trials, representing a bridge between theory and method of analysis. The purpose of our initiative was to recreate as best as possible, the Gumelnita pottery, using techniques, methods and also materials that we think were easily available to the prehistoric communities of Sultana. In our endeavor we have turned to the elders from the local community for help in identifying local clay sources and other raw materials, that are close to the Eneolithic tell-settlement we are investigating since 2001. In doing so, we have permanently involved the local community in our research projects, getting knowledge from the elders and positive initiative from the young generation. This paper will present the results of seven-year Experimental Archaeology Project on making Neolithic pottery, inspired by our research in the Kodjadermen-Gumelnita-Karanovo VI tell settlement from Sultana-Malu Roșu, south east Romania. In our work we have experimented with different hand-making techniques such as building the vessels from one lump of clay, coiling and also molding. In making the pots we have also tested a series of hypotheses regarding the types of clay, temper, modeling, burnishing, decorating, drying and firing. Advantages and disadvantages of every technique that we have experimented will be detailed.

Complementary to the quantifiable results, personal experience of those involved has been substantially increased over the years. After all this time, our experimental project had a positive impact especially among the younger generation, actively participating together with archaeologists, opening possibilities for sustainable local development of small business.
Acknowledgements: Work supported by CNCS– UEFISCDI project PN-III-P2-2.1-PED-2016-0742.

04 BALTIC EXPERIMENTAL ARCHEOLOGY SUMMER SCHOOL: INITIAL RESULTS 2017

Author: Dr. Tomsons, Arturs - Latvian National History museum (Presenting author)
Keywords: Archaeology, sustainability, urban-gardening
Presentation Preference: Oral

During 2017, a project of the Baltic Experimental Archeology Summer School on Lucavsala's Island, in Riga, Latvia, was carried out. This project, as well as previous similar prehistoric skills learning ones which were held at the Āraiši Archeological Museum Park, (EXARC member) were supported by the Latvian State Cultural Capital foundation. Historically, the island was a gardening area for local inhabitants, but since the 1990's, it has fallen into decay. Since 2013, a local youth activist group, "Eco-Community" has begun organizing a campaign to promote and rent such abandoned gardens.
Since 2015, the author of this report as well as the "Archaeo Club Latvia" have been renting 1500m2 of land from the Riga Municipality, where they started organizing various educational activities, including primitive technology, experiential and experimental archeology.

In 2016 a part of preparation actvities for Āraiši camp took place in Lucavsala garden area too. This was carried out in close cooperation with archeology and anthropology students from the University of Latvia.

The purpose is to create a "demo" version of a functioning miniature archeological park/garden, where students and all participants can learn additional prehistoric skills and get knowledge about methods of experimental archaeology (which they cannot get in the university) and during this process abandoned territories are re-cultivated and brought back to life as well.

410 LANGUAGE IN EUROPEAN PREHISTORY

Theme: 6. Interpreting the archaeological record
Author: Scutt, Winfrid (United Kingdom) - English Heritage
Co-Author(s): Otte, Marcel (Belgium) - Université de Liège
Keywords: language, prehistory, Europe
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

How old is Indo European? What methods are suitable and appropriate for establishing an absolute chronology of Indo-European languages. To what extent can we use culture, genetics or linguistics to do this?

This session will not only look at methodology but will also look at alternatives to the Kurgan Hypothesis, for example the Continuity Theory that places the origin of Indo European in the Palaeolithic; and the Farming/Language Hypothesis.

The Session will focus on the distribution and chronology of Indo-European languages in Eurasia from the Palaeolithic to the Iron Age. Speakers will draw on a range of methods, including phylogenetic, toponymic, numismatic and historiographic to examine alternative models for the dating and dispersal of Indo-European languages.

01 MULTILINGUAL COIN INSCRIPTIONS IN PRE-ROMAN EAST ANGLIA

Author: Dr Nash Briggs, Daphne - Retired (Presenting author)
Keywords: Coins, Germanic, Britain
Presentation Preference: Oral

Inscriptions on ancient British coins mostly name the war-lords, rulers, or officials responsible for the coinages in question, and lend scraps of insight into language use, at least amongst the senior social elite in southern Britain, between the late first century BC and c. AD 45 or 60, or whenever native coinage ended after Claudius' conquest. Almost all such names are plainly in Brittonic, or are in Latin reflecting Brittonic (an interesting language choice in its own right). There are, however, some conspicuous exceptions, all in Norfolk, where several coin inscriptions record non-.Latin, non-Brittonic, but plausibly West Germanic names and speech-forms. These must belong to some of the richest and most influential families in the northern cantons of the Civitas Icenorum, long before the Romans can have had any direct influence on the character of Britain's ethnic mix. They therefore raise some very interesting questions about the identity and maritime connections of some of the permanent residents of the Fen edge and North-Sea shoreline.

02 USING PLACE-NAMES TO BUILD ABSOLUTE CHRONOLOGIES FOR LANGUAGE: THE CASE OF ENGLISH IN PREHISTORIC BRITAIN

Author: Mr Scutt, Win - English Heritage (Presenting author)
Keywords: language Germanic place-names
Presentation Preference: Oral

While linguistic methodologies can analyse complex relationships between languages and can establish relative chronologies, it has proven difficult and controversial to establish absolute chronologies. The development and dispersal of the Indo European languages are variously attributed to the Upper Palaeolithic, the Neolithic and the Bronze Age, the last of which is currently most favoured by linguists.
Through the study of place-names in relation to environmental change and archaeology, it is suggested in this paper that we can suggest absolute time-frames.
The methodology adopted in this study is to analyse landscapes in eastern Britain that are known to have changed significantly between the prehistoric and the medieval periods. The majority of place-names in the English landscape are made of elements of "Old English", the name we give to the language spoken in parts of Britain between the end of

the Roman period (conventionally 410AD) and the Norman Conquest (1066AD). If groups of Old English place-names indicate a landscape that prevailed in prehistory, then this would suggest that a Germanic language, an ancestor to English was being spoken.
Key landscape features that change in the Holocene are large bodies of water ("meres" in Old English) and islands ("ey" in Old English). Analysis of evidence from landscape and environmental archaeology demonstrates that some meres had dried out by the Roman period, yet the surrounding English place-names describe their extent in the prehistoric period.
While the arrival in Britain of a Germanic language can be established from this research as having taken place no later than the second millennium BC, it is not yet possible to determine the period more precisely. It is hoped that the other papers and discussion in this session might throw some light on the most likely chronology.

03 DNA AND THE ORIGINS OF THE BRITISH

Author: Dr Evans, Chris - University of Cambridge
Co-Author: Dr Forster, Peter - University of Cambridge (Presenting author); Dr Burger, Joachim - University of Mainz; Dr Lucy, Samantha - University of Cambridge
Keywords: Genetics Britain a-dna
Presentation Preference: Oral

Several DNA surveys have revealed current geographic subdivision in the genetic landscape of the British Isles. The next phase will be to attach dates to when these genetic units came into being. Such dates can be obtained by applying thw molecular clock to modern DNA, or to analysing ancient British DNA directly from archaeologically dated sites.

04 WRONG HORSE? WRONG WHEEL? WRONG LANGUAGE?

Author: Mr Morris, Jonathan - ASLIP (Presenting author)
Keywords: Indo-European, language, dating
Presentation Preference: Oral

The Kurgan theory, first formulated by Gordon Childe and revised by Marija Gimbutas, is enjoying a zombielike afterlife, bolstered by new ancient DNA results, which suggest that Europe was extensively repopulated by migrants from the Pontic Steppes, following the failure of the farming systems established in the Neolithic.

The most salient archaeological proponent of this case in recent years has been David Anthony, who has proposed a sweeping invasionist theory based on his discovery of a wheeled wagon in this region dating to the middle of the fourth millennium BCE. Anthony's case for such Bronze Age horsemen conquering the world by virtue of this putative massive technological breakthrough is nevertheless spurious. Indeed, while it is only possible to observe the development of Indo-European languages to a time depth of some 1 to 4 millennia, representing only the latter third or half of the period over which, in Antony's view, Indo-European languages spread over Eurasia and differentiated into highly diversified families, my own work suggests that Anthony is blithely assuming linguistic behaviour during the initial unobservable phase of this process which is diametrically opposed to the behaviour during the observable period. Furthermore, his linguistic archaeology of wheel words systematically ignores all comparative data from other language groups and as such, fails to address the likelihood that such words are nothing more than loanwords. The evident implication is that Indo-European is older.

05 THE PALAEOLITHIC HYPOTHESIS FOR INDO-EUROPEAN

Author: Professor Ballester, Xaverio - Universidad de Valencia (Presenting author)
Keywords: Indo-European language palaeolithic
Presentation Preference: Oral

A central claim of the now so–called Palaeolithic Continuity Theory or Paleolithic Continuity Paradigm is that most or possibly all major linguistic groups (Afro–Asiatic, Amerind, Australian, Khoisan, Niger–Kordofanian, Nilo–Saharan, Uralic...) already existed in the Upper Palaeolithic. Although this is a date far beyond the traditional horizon of Indo–European studies, through independent and convergent research the new paradigm has been collecting many arguments to support the hypothesis of a Palaeolithic time slot and consequently a hunter–gatherer culture for Proto–Indo–European too. On the contrary, although the prehistoric Urnfield Culture has traditionally been linked to Indo–European people, there are good reasons to believe that it would better be attributed, at least partially, to non–Indo–European speakers (Basques, Etrurians, Iberians).

06 THE ORIGINS OF INDO EUROPEAN LANGUAGES IN THE PALAEOLITHIC

Author: Professor Otte, Marcel - University of Liege (Presenting author)
Keywords: languages palaeolithic Indo-European
Presentation Preference: Oral

The origins of IE languages during Palaeolithic times especially with the movements of modern people, from the steppic asiatic areas towards continental Europe, The so-called "Cro-Magnon" people are at the roots of our present European populations, The genetic data also indicates the same conclusion,
Nothing has really changed for about forty thousands years, and all the succeeding civilisations have always been founded on the local peopling. Our challenge now is convincing our colleaugues who are attached to their faith, This is the most difficult task. "It's easier to break a particle than a conviction", said Einstein.

07 THE NEW GENETIC NARRATIVE OF THE KURGAN HYPOTHESIS : SOME PROBLEMS

Author: Professor Demoule, Jean-Paul - Université de Paris I Sorbonne (Presenting author)
Keywords: Indo-European Kurgan Genetics
Presentation Preference: Oral

The canonical Indo-European model, which was originally a purely linguistic one, is founded on a central assumption: that of an original people (Urvolk in German), who inhabited an original homeland (Urheimat) where they spoke an original language (Ursprache). They left this homeland to spread progressively throughout a large part of Eurasia, giving rise through the process of scissiparity to all of the historically known Indo-European languages and to the peoples who spoke, or still speak, them. In fact, the Kurgan hypothesis,

the most popular one, lacks real archaeological proofs. Nevertheless, palaeogenetics was recently supposed to bring new proofs of a massive migration from the steppes to North-Western Europe. A new narrative try now to bridge the gap between archaeology and genetics. But is the traditional canonical model the only possible one ?

08 INDO-EUROPEAN: THE LANGUAGE OF CRO-MAGNON

Author: Professor Benozzo, Francesco - Università di Bologna
Co-Author: Professor Alinei, Mario - University of Utrecht (Presenting author)
Keywords: Indo-European Cro-Magnon language
Presentation Preference: Oral

The emergence of Indo-European people in Europe and Asia must be seen as one of the major episodes of the emergence of Homo sapiens in Europe and Asia from Africa, and not as an event of recent prehistory. Cumulative evidence shows a complete continuity between the Paleolithic hunters and the Indo-European population known from texts: Celts, Germans, Slavs. In archaeological and paleontological terms, the only observable break corresponds to the transition from the Middle Palaeolithic (Neanderthal) to the upper Palaeolithic (Cro Magnon), and it is from this moment onward that a history of languages and cultures develops in an autonomous way. The differentiation process of IE languages from the Proto-IE common language, reconstructed by comparative linguistics, as well as that of their already separated branches (Proto-Celtic, Proto-Germanic, Proto-Italic, Proto-Balto-Slavic, Proto-Greek etc.) into their presently 'substandard', 'dialect' varieties, must have taken an extremely long time, and they must have been associated first with the varying episodes of the original migration from Africa, and then – with an increasingly faster tempo as social stratification and colonial wars began – with the varying cultural, social and political stages the new fragmented groups went through in the different settlement areas.

09 GEOLINGUISTIC CONTINUITIES IN THE CELTO-ATLANTIC AREA AND IN WESTERN EUROPE

Author: Dr Le Bris, Daniel - Université de Bretagne Occidentale (Presenting author)
Keywords: linguistics Indo-European Celtic
Presentation Preference: Oral

The archæological discoveries of the last thirty years show at an overwhelming majority that there is no evidence of an Indo-European invasion during the 4th Millennium BC at the scale of the European continent. The traditional "Kourgans' theory" is confronted with numerous contradictions and constitutes no longer a satisfactory hypothesis.
In that context of reconsidering the origin of European languages, the Celtic people would not come anymore from a territory situated between Austria and southern Germany, as being accepted since the nineteenth century. Since the Mesolithic they could have settled as groups of fishermen and seafarers along the Atlantic shores from the Iberian Peninsula to the British Isles passing through the ancient Gaul (Alinei 1996-2000, Alinei-Benozzo 2008, Ballester 2012).
On the basis of dialectal and geolinguistic data, this approach tries to understand better this hypothesis. By studying geolinguistic variations, it considers the Celto-Atlantic area and the exchanges it may have had over the long term with the linguistic areas in contact like the Germanic and the Romance one. New lexical insights of Celtic on Romance and Germanic (and vice versa) open research perspectives and raise real questions about the phenomena of the continuity of languages and populations in the Atlantic zone of Europe.

10 A GEOGRAPHY OF P-CELTIC

Author: Mr Scutt, Winfrid - English Heritage (Presenting author)
Keywords: P-Celtic Indo-European language
Presentation Preference: Oral

I shall consider the group of P-Celtic languages that have been spoken on the Atlantic seaboard of Europe – Cornish, Breton, Welsh and Cumbric. If one or more Germanic languages were spoken in the east of Britain, what scenarios might account for how these languages were conveyed to this area and how, when and where did they divide into the distinct languages that we know? The traditional view, with origins in the 16th century, was that these languages were spoken by "Celts" who occupied much of western and north-western Europe until displaced, first by speakers of Romance languages (in France and Spain for example) and then by speakers of Germanic languages as the Western Roman Empire succumbed to invasion. This same view sees the arrival of P-Celtic speakers in Brittany displaced from their British home in the post-Roman period.
This paper considers a number of alternatives; that the speakers of Breton are a Celtic fringe that was not displaced by the Roman invasion; that speakers of Cornish and Breton had once migrated from Wales; or that the Cornish colonised Wales and Brittany; or that at some in the prehistoric period, groups of Breton speakers moved north to settle in Cornwall and Wales.
The distinctiveness of the Breton place-names from those in Cornwall suggests that the separation of the two groups must have taken place much earlier than the post-Roman period.
The geography supports a more radical interpretation that fits the Palaeolithic Continuity Paradigm. At a stage in the Late Pleistocene or Early Holocene a group of proto-P-Celtic speakers lived at the mouth of the Channel River – now the Celtic Sea. At this time this group could survive on the bounty of Europe's largest river, filled with nutrients, as it reached the Atlantic and collided with the Gulf Stream.

11 THE LOST TWIN: AN ALTERNATIVE RECONSTRUCTION OF PROTO-INDO-EUROPEAN MYTH

Author: Mr Grigsby, John - Bournemouth University (Presenting author)
Keywords: Muthology, Indo-European, Neolithic
Presentation Preference: Oral

As with their proto-language, the earliest myths of the Proto-Indo-European (PIE) peoples have been tentatively reconstructed by scholars (most notably Bruce Lincoln) based on the premise that the culture that produced such myths was androcentric, pastoral, and nomadic in nature; accordingly, the rich vein of female/cow/farming symbolism found in extant Indo-European myths is viewed as the result of interactions with non-PIE farmers encountered during the language spread, rather than being primary. But is this the case? Renfrew's 'Anatolian hypothesis' posits the alternate idea that the Indo-European languages spread with farming, and in this paper I will also be arguing that the farming metaphors and imagery in the myths are primary, not secondary, supporting his theory. I will show that although Lincoln's chief source for his reconstructed creation myth (in which the world is formed by the brothers 'Twin' and 'Man') are Indo-Iranian, Doniger O'Flaherty has demonstrated that these myths were once rich in female/cow symbolism which had been expunged over time due to a 'power shift' in these cultures – the opposite process to that suggested above where cow symbolism was presumed to have arrived

later. Indeed, I will show how Lincoln's reconstructed cosmogonic myth does not bear scrutiny: instead of an all-male creation, we find numerous examples of male and female cosmogonies, the female partner being associated with cows and rivers, and who with her male partner form the cosmos in the same way as the primal parents found in Near Eastern myths.
Accordingly, I will argue that the current reconstructions of PIE myth are invalid and must give way to a new reconstructed cosmogony – one whose direct and obvious parallels to the Near Eastern myths suggests a re-evaluation of the time and place of the genesis of the Indo-European languages is necessary.

412 ROMAN ARCHAEOLOGY BEYOND REGIONAL SCHOLARLY TRADITIONS: HISTORY AND PERSPECTIVES

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author: Tamburrino, Eugenio (Italy) - Università Ca' Foscari - Venezia
Co-Author(s): Richard, Julian (Belgium) - Département d'Histoire de l'Art et Archéologie - Université de Namur
Keywords: Roman Archaeology, Europe, Scholarly traditions
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The 23rd Annual Meeting of the EAA that will be held in Maastricht – one of the Europe's cores – is a good cause for a reflection upon the state of the art of Roman Archaeology, in the broadest sense of this definition, in Europe. In a time that calls for breaking down barriers – also the scientific ones – within the European Union and more in general within the European Nations, we cannot ignore how Archaeology is still affected by different approaches that are the result of settled traditions or even specific disciplinary orientations at the level of nations. These differences marked, and to a certain extent still mark, the development of Roman Archaeology as a whole; in particular, three strains of the discipline appear to concern this issue: theory, methodology, archaeological themes.
The aim of this session is to outline the development of these specific scholarly tendencies within the history of Roman Archaeology, but also to reflect upon some prompts in order to understand if and how will be possible to overtake these specific approaches. Some topics that could be taken into account, even if further proposals are encouraged, are: Roman Archaeology, arts and artifacts: which relation?; Documentation and data interchange: which present, which future?; Roman Archaeology and other disciplines: which relation?
Particularly welcomed are papers that at the same time deal with geographic boundaries as a conditioning factor for the development of discipline, historiographic focus and prospective reflections on how to establish disciplinary dialogue beyond national boundaries.

01 ROMAN ARCHAEOLOGY BEYOND NATIONAL SCHOLARLY TRADITIONS: AN INTRODUCTION

Author: Mr Tamburrino, Eugenio - Universita Ca' Foscari, Venezia (Presenting author)
Keywords: Italian Roman Archaeology
Presentation Preference: Oral

Modern Roman Archaeology has to face, especially in Europe, a long-lasting history of study and research, that has been often affected by local scholar tendencies developed in specific areas of Europe. This legacy to a certain extent still marks the development and the scientific advancement of the discipline, in particular with regard to the main issues of theory, methodology and archaeological themes.
The contribution aims to introduce the session, also using some examples from Italian Roman Archaeology, looking to its history in order to highlight how the development of the discipline and the results achieved have been driven by local scholarly tendencies and their conservation or overcoming.

02 BEYOND NATIONAL FRONTIERS: TOWARDS AN ANTHROPOLOGICAL APPROACH TO ACADEMIC COMMUNITIES AND ACADEMIC DISCOURSE IN ROMAN ARCHAEOLOGY

Author: Dr Gonzalez Sanchez, Sergio - University of Leicester (Presenting author)
Keywords: discourse, communities, anthropology
Presentation Preference: Oral

The study of the past is undeniably tied to the socio-cultural and historical contexts in which scholars formulate their academic discourse. Roman archaeology is no exception, and the various approaches to the Roman-barbarian dichotomy that lies in the foundations of Europe's cultural heritage are a perfect example of this.

As part of the post-war intellectual tradition and throughout the later twentieth century until now, European archaeologists have devoted numerous studies to the reflective analysis and historiographical critique of national (nationalistic) approaches to the past. The identification and acknowledgment of these scholarly trends are part of the process that derived from what Trigger (1987) described as the "critical self-reflective stage" of Archaeology as a discipline. However, most of these studies have a limited national scope, and even when compared with other national scholarships, the importance of other spheres of influence in the formulation of academic discourses about the past is often ignored. As an academic community we have yet to devise effective self-analytical methods to move beyond simple 'national' trends. Establishing methodological dialogues with other disciplines may hold the key.

In this paper I propose an anthropological approach to the study of the national academic communities that formulate archaeological discourses about the Roman past as a way to tackle these ongoing issues. Using interview and contextual data to understand the development of academic discourses within the Dutch academic community, I intend to explore the applicability and effectiveness of this methodology in overcoming the limitations of our current 'national' historiographical analyses. I will focus on regional, local, institutional, personal and European spheres, and take into account other transversal factors such as hierarchical institutional structures, gender, and funding. The interaction of all these spheres of influence will help draw a more accurate picture about current individual and collective academic discourses in Roman archaeology.

03 HIC SUNT DRACONES: THE CREATION AND ISOLATION OF ROMAN WALES.

Author: Miss Reynolds, Leah - Cardiff University (Presenting author)
Keywords: Roman Archaeology, Wales
Presentation Preference: Oral

Though during the Roman period there was no set limes dividing the area bounded by the modern nation of Wales and the broader cultural area of Roman Britain, there has been a tendency in modern archaeological work to treat the region as distinct. While this is partly a function of the administrative and political status of Wales as a devolved nation, it may also in part be attributed to the persistence of the image of the region during the Roman period as materially poor and culturally conservative. It is a region which lay at the fringes of the Roman empire, and continues to find itself for the most part at the periphery of the discipline of Roman archaeology. As such, Wales presents an interesting case study in the divergent developments of a regional archaeology as a subset of the broader field of the study of Roman Britain.

This paper will consider the impact of the distinct historiographic, administrative, and political developments of Wales as a small nation nested for much of its post-Roman history within the larger entity of Great Britain, and how this has shaped its status and image as a sometimes-marginalised 'Roman Wales' within the wider tradition of Romano-British archaeology. I will explore how developments in archaeological practice and theory have impacted the development of the discipline in Wales, and whether the trend towards so-called 'big data' archaeological projects can help to redress the balance or perpetuate long-held views.

04 MODERN ARCHAEOLOGY AND OLD-FASHIONED IDEAS: CONSEQUENCES IN THE INTERPRETATION OF MONUMENTS

Author: Miss Zampieri, Eleonora - University of Leicester (Presenting author)
Keywords: roman archaeology, interdisciplinarity
Presentation Preference: Oral

Scholars have often highlighted the need to maintain and strengthen the interdisciplinarity between archaeology and ancient history. Many current university courses of archaeology include ancient history modules and young would-be ancient historians have to take archaeology modules, or even participate in archaeological excavations, in order to complete their degree. Nevertheless, it still happens that (in some countries more than in others, and to different degrees) historians do not take into consideration archaeological information pertaining populations or individuals they are studying. Likewise, archaeologists either do not take into account historical research, or, if they do, they hold on to old-fashioned historical interpretations; otherwise they do so in order to identify events, peoples or individuals attested in historical texts. This, naturally, presents problems for both respective disciplines.
My intention is to address this issue from the perspective of archaeology, specifically in the way in which conventional historically informed interpretations belie the multivalence of ideological and social meanings of architectural monuments. An example of this phenomenon is the interpretation of monuments built in Rome during the first century BC by outstanding politicians, in particular Caesar and Pompey. The interpretation of ideological and political meanings of the buildings promoted by the two generals has been often limited to notions of a 'triumphal monument' or 'dynastic complex'. These explanations are certainly valid, but they do not account for the complexity of the historical process and personalities outlined by recent historical scholarship. This paper aims to address this problem, and highlight some issues that can benefit archaeology from the use of the most recent research in ancient history.

05 FIGHTING AGAINST THE ODDS: THE DEVELOPMENT OF ROMAN MILITARY ARCHAEOLOGY IN NW IBERIA

Author: Dr. Costa-García, José M. - Universidade de Santiago de Compostela; Vrije Universiteit Amsterdam (Presenting author)
Keywords: Roman-conquest, changing-landscapes, fragmentation
Presentation Preference: Oral

Although the archaeological evidence related to the Roman military presence has grown exponentially in NW Iberia from the 1990s onwards, we still lack studies characterised by a holistic perspective on the conquest and occupation of these territories in ancient times. Several factors can be outlined when trying to explain this situation. Firstly, the Iberian territories located north to the River Douro show a diversified landscape (high mountain ranges, extensive plains, densely forested zones, steep valleys...), which makes the development of comprehensive methodologies difficult. Secondly, the political fragmentation of this huge area (about 127000 km2) has to be noted: the land is divided between two modern countries (Spain and Portugal), several autonomous regions, provinces, municipalities and even parishes. This fragmentation means the existence of different Heritage laws, institutions, and administrative procedures, but it has also an impact on other important aspects for the present-day archaeological research, such as the accessibility to and the quality of geographical datasets. Last but not least, the existence of different scholarly traditions on the study of Late Iron Age and Hispano-Roman societies has generated several controversies. Moreover, the debate around these historical phenomena and the role played by the different agents in them has been influenced by political philosophies, as well as contributed to feed some regionalist or nationalistic claims, both centralistic and peripheral. Indeed, these ideas still shape the local identities to a great extent.
In order to overcome this situation, the development of inclusive, multi-disciplinary methodologies is needed. The analysis of the archaeological record in a more standardised, disinterested way, allows us to understand the changes in the landscape, devoid of artificial boundaries. Only after this can we start to build up new narratives on the conquest and occupation of NW Iberia in Roman times.

06 ROMAN LIGHTING IN PORTUGAL AND SPAIN

Author: Ms Lima, Carolina - University of Reading (Presenting author)
Keywords: Roman, Iberia, Lighting
Presentation Preference: Oral

While many features of the Roman Empire are superficially similar across its entirety, there are often subtle regional differences that provide revealing insights into local practices. Lighting equipment represents an important form of material culture in many provinces but the lack of standardized methods of recording across Europe has made it increasingly difficult to compare archaeological data across the Mediterranean and beyond.

This project examines the role of lighting equipment in the social, economic and ritual practices of the people of Roman Lusitania (modern Portugal and western Spain). It deliberately combines material from two modern countries to study an ancient province, and also explicitly compares the data from Lusitania to other provinces to better understand

lamp typology, chronology and use. I have adopted a theoretical framework shaped by Anglophone scholars while engaging in detail with the archaeological record of a region that does not necessarily have a long tradition of small finds research.

This paper highlights the benefits as well as the challenges of working with these approaches in the Mediterranean and argues that constructive dialogue between traditions has never been more relevant than under the current political climate.

413 NEW APPROACHES IN METAL STUDIES

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Wärmländer, Sebastian (Sweden) - Stockholm University; Cotsen Institute of Archaeology, UCLA, USA
Co-Author(s): Sholts, Sabrina (United States) - Department of Anthropology, National Museum of Natural History, Smithsonian Institution, Washington DC, USAPaavel, Kristiina (Estonia) - Department of Archaeology, University of Tartu, EstoniaJouttijärvi, Arne (Denmark) - Heimdal Archaeometry, Skovledet 30, Virum, Denmark
Keywords: Archaeometallurgy, archaeometry, metals,
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Technical advances in the last decades have provided archaeometallurgists with numerous new instruments and technologies, such as portable 3D-scanners and XRF, XRD, and IR/Raman units, as well as stationary 3D microscopes, environmental/low-pressure SEMs, and so on. Such instruments can provide accurate chemical/morphological data, often in a non-destructive fashion. This session welcomes all kinds of papers on metallurgical analyses employing such "new" technologies. In addition, we welcome papers on new approaches to archaeometallurgical research questions, and new ways to use metal analyses to investigate e.g. the mobility of people and exchange of material goods and ideas within Europe. Thus, we want the session title - New approaches in metal studies – to be interpreted in the broadest possible way. Still, in this Brave New World of technological advances, we do not necessarily believe that "new" equals "better". We therefore also welcome papers dealing with "old-fashioned" approaches to metallurgical studies, especially in cases where the author can show why the "old-fashioned" method still remains relevant and difficult to replace.

01 LARGER THAN THE INDIVIDUAL CONTEXT - ON THE KNOWLEDGE STORED IN LARGE AMOUNTS OF DATA

Author: Jouttijarvi, Arne - Heimdal-archaeometry (Presenting author)
Keywords: metals, technology, trade
Presentation Preference: Oral

Through individual studies data that can shed light on issues in the context of the individual archaeological site or context is created. It is however rare that these data are accumulated and processed in large quantities.
Large number of analyzes of metal objects may form the basis for study of various more general issues. Based on more than 9000 analyzes of Roman objects of copper alloys it has thus been possible to get closer to the thoughts and alloy traditions that were widespread and uniform throughout the Roman Empire. These traditions can be contrasted to the more haphazard use of scrap that took place in areas outside the Roman Empire.
Similarly, a collection of data from individual studies on materials and articles geographical origin provide an insight into the production, trade routes and their development in time and space, as well as the development and diffusion of technological traditions and ideas. All this knowledge that it would be difficult to achieve by other means.
This is illustrated by the changes in production, import and technology of iron from the beginning of the Iron Age to the Medieval Period, as seen through the accumulation of more than 500 analysed iron objects from Denmark.

02 AN INTERDISCIPLINARY APPROACH TO ANCIENT METALWORK

Author: Dr Armbruster, Barbara - Centre National de Recherche Scientifique (Presenting author)
Keywords: archaeometry/archaeometallurgy/experimental archaeology/ethnoarchaeology
Presentation Preference: Oral

The study of ancient metalwork is a complex undertaking that involves competing methods from humanities as well as from material sciences. This paper deals with an interdisciplinary methodology to arts and crafts specifically suitable to shed light on the fine metalworking and integrating both .fields of research. It aims in presenting an cross-view with an interdisciplinary approach on fine metal technology, involving manufacturing techniques, workshops and tools. The purpose is to scrutinise the steps of the "chaîne opératoire" of the transformation from the raw material to the finished object. Applied to a series of metal work this manifold approach to technological aspects can lead to the perception of traditions, inventions, exchange of technical knowledge, mobility of craftspeople and external influences in the craft. The study of the original metal artefact starts with conventional archaeological and stylistic examinations. It is followed by optical tool mark analyses and the examination of the surface topography combined with methods from material science such as radiography, SEM and chemical analyses of alloy composition. Beyond that, the manifold approach adds information from ethnoarchaeology, experimental archaeology, ancient written texts and graphic depictions. These functional analogies offer an important additional consideration to elucidate artisans, their work and know-how. They also allow to establish explanatory models of workshop organisation, as well as economical and social interaction within the metal craft. Case studies from Bronze and Iron Age contexts will give insights in the application of this multifaceted approach to metalwork. The intersection of the different visions allows to draw a picture of early fine metalworking and the history of technology, and it might be a step forward for crossing the divide.

03 AN HHPXRF EXPLORATION OF THE SURFACE OF ROMAN PERIOD COPPER-ALLOYS AFTER EXPOSURE TO DIFFERENT CREMATION TEMPERATURES.

Author: Mr Roxburgh, Marcus Adrian - Leiden University; Tartu University (Presenting author)
Keywords: HHpXRF Cremation Roman
Presentation Preference: Oral

Many hundreds of copper-alloy artefacts have been recovered from Tarand graves in Estonia and Latvia. Many of these items exibit severe to moderate fire damage having been present in cremation fires. However there are as many if not more items that appear to have had much less exposure. Even though their surfaces are frequently coated with ash or other burning related debris this does not neccessarily mean that they were part of the main cremation act.
Determining the heat at which these items were exposed would be beneficial to archaeological research by differentiating which items were central within the cremation process, and which items may have been exposed to cooler (peripheral) temperatures, or perhaps to no heat at all.
This presentation explores the use of hand-held portable X-ray fluorescence spectrometry (HHpXRF) to identify basic chemical changes on the surface of Roman period copper-alloys due to exposure to different cremation related temperatures.

04 TECHNICAL EXAMINATION OF SMALL BELLS EXCAVATED FROM 10TH-14TH C. GRAVES IN NORTH-EAST EUROPE

Author: Dr. Wärmländer, Sebastian - Stockholm University; UCLA/Getty Conservation Programme, Cotsen Institute of Archaeology, UCLA (Presenting author)
Co-Author: Dr Chugunova, Ksenia S. - Department of scientific and technical examination of works of art, State Hermitage Museum, Saint-Petersburg, Russia; Roxburgh, Marcus - Faculty of Archaeology, Leiden University, Netherlands.
Keywords: XRF, mediaeval metallurgy
Presentation Preference: Oral

In this work we investigated around 200 small bells excavated from 10th-14th c. graves in North-East Europe, i.e. modern-day Estonia, Latvia, Russia, and Ukraine. The bells were examined with stationary or portable X-ray fluorescence (XRF) units and were all found to be composed of copper alloys, with the second main alloy component being either tin (1-25 %) or lead (1-47%). Some regional patterns in the alloy composition were observed, which we discuss in terms of trade and crafting traditions. We also discuss the usefulness of XRF analysis for identifying surface treatments of copper-alloy objects, such as coating with tin or pewter, which are important factors in the original visual appearance of ancient metal artefacts.

05 METALWORK WEAR ANALYSIS: THE COMING OF AGE OF A 'NEW' ANALYTICAL METHOD

Author: Dr Dolfini, Andrea - Newcastle University (Presenting author)
Co-Author: Dr J Crellin, Rachel - University of Leicester
Keywords: Metalwork, use-wear analysis
Presentation Preference: Oral

The paper explores the history, applications, and future developments of a relatively new analytical approach to the study of ancient metal objects: metalwork wear analysis. Grown at the intersection between lithic microwear analysis and archaeometallurgy in the late 1990s, this technique has been developed in the last twenty years by a handful of scholars, often working in isolation from one other. This has led to a slow growth of the discipline, which only now is coming of age (Dolfini and Crellin 2016). Drawing from their own, as well as other people's, research, the authors present a critical history of metalwork wear analysis from its pioneering stages to its latest developments. In the paper, special attention is paid to: (1) how metalwork wear studies have advanced our knowledge and understanding of prehistoric copper-alloy tools and weapons; (2) what is the established research methodology and how it can be improved; (3) and where the subject ought to be steered in years to come. Future developments discussed in the paper include an urgent requirement to formalise and share analytical protocols; the need to better understand wear formation processes and its relationship to alloy composition and surface corrosion; how to conduct meaningful experiments for the replication of ancient wear marks; the desirability of sharing information amongst analysts; and new technological applications including 3D modelling, confocal microscopy, and digital imaging techniques.

References cited
Dolfini, A., & Crellin, R. J. (2016). Metalwork wear analysis: The loss of innocence. Journal of Archaeological Science, 66, 78-87.

06 USE YOUR EYES – METALLOGRAPHIC VERSUS SUPERFICIAL TRACES OF THE CRAFTING OF BRONZE AGE ORNAMENTS

Author: Dr. Noergaard, Heide - Aarhus University, School of Culture and Society (Presenting author)
Keywords: BronzeAge, metalcraft, metallography
Presentation Preference: Oral

How should it be possible to see the techniques used in crafting prehistoric artefacts only with the naked eye? Is it at all necessary when we have plenty of technical possibilities to look through and into prehistoric artefacts? This presentation will explain why both, natural scientific analysis and superficial archaeological examinations can be used to understand prehistoric craft. Furthermore, it will show that with an intensive knowledge about previous scientific investigations the superficial traces preserved can reveal a great amount of information and could talk for themselves.
Taking as an example the early and middle Bronze Age bronze ornaments from North Germany, superficial traces of the metal crafting process, visible with the naked eye, will be compared with metallographic images. The aim of this presentation is to give an overview over the crafting traces everybody could see (with a bit training), and to show the characteristic traces of some technical processes in metal craft. Additionally, by showing and explaining the differences within the two major metalworking techniques, that appear in the material of the Nordic Bronze Age, on experimental crafted belt discs, a trace catalogue of superficial crafting traces for further studies will be put on display. As the destructive sampling of artefacts kept in museum exhibitions is becoming more and more difficult, such a basic knowledge concerning the residues of the crafting processes would allow examining artefacts non-destructively and revealing the knowledge and organisation of prehistoric metal craft.

07 NEW TECHNOLOGICAL DATA REGARDING THE METAL OBJECTS IDENTIFIED IN THE ENEOLITHIC SITES FROM SOUTHEASTERN ROMANIA

Author: PhD candidate Darie, Adelina - Bucharest Municipality Museum (Presenting author)
Keywords: Eneolithic, metal, XRF
Presentation Preference: Oral

This study focuses on the technological approach on the copper and gold artifacts from the Southeastern Romanian plain, during the Eneolithic period. Firstly, the objects described as tools and ornaments were submitted to morphological analyses, resulting in reduced tipological variation, as the majority of the objects are considered to be tools. The study includes a brief mention of the previous XRF compositional analyses performed on the copper tools and gold ornaments identified in the Eneolithic archaeological sites (Harsova, Luncavita, Sultana-Malu Rosu, Vladiceasca-Ghergalaul Mare, Chirnogi-Suvita Iorgulescu and Chirnogi- Suvita lui Ghitan). New XRF analyses performed on the copper tools from Vidra Eneolithic settlement, found in the Bucharest Municipality Museum archaeological collection, are the main focus of the research, introducing new data and comparative study.
Thus, we are trying to identify whether certain morphological or technological patterns, derived from the compositional analyses performed on the objects from the southeastern Romania, are to be found.
Furthermore, an important part of the research is represented by the discussion around the raw material sources of copper and gold used in manufacturing metal artifacts from the Eneolithic sites in the Southeastern Romania. Given the geographical background of this area, the absence of metal ores, it is necessary to evaluate whether raw material from the metal ores placed within the Carpathians Mountains, Balkans and Serbia, as well as gold alluvial deposits could be traced back to the manufacturing of the fine pieces discovered in the studied area.
This study represents a part of the doctoral research performed on the metal ornaments identified in the Eneolithic sites from the Southeastern Romania.

08 OPTOELECTRONIC INVESTIGATIONS ON THE BRONZE HOARDS FROM TARTARIA (ALBA COUNTY, ROMANIA)

Author: PhD BORS, Corina - National History Museum of Romania (MNIR) (Presenting author)
Co-Author: PhD Radvan, Roxana - National Institute for Research and Development in Optoelectronics (INOE 2000); PhD Ghervase, Luminita - National Institute for Research and Development in Optoelectronics (INOE 2000)
Keywords: bronze hoards investigations
Presentation Preference: Oral

In 2012, through a large scale archaeological excavation occasioned by the construction of a future motorway, were discovered two hoards of bronze and iron objects. These were discovered on the southern limit of a very large prehistoric site, located on the left bank of the middle Mureş valley, at Tartaria (Alba county), preliminary dated during the 8th c. BC (the middle Hallstatt period). The two hoards were discovered within a ditch, marking the southern limit of the site. The structure of the deposits is complex and varied, containing weapons, tools, jewelry and harness objects. The first hoard comprises more than 300 objects, being one of the largest ever found corresponding to the 9th–8th c. BC period in the Carpathian basin, while the second consists of 50 objects.
As part of a scientific project (acronym PILOT), were made a series of optoelectronic investigations upon more than 120 objects (of bronze and iron) part of the two hoards. There have been made spectroscopic recordings (LIBS and XRF) on certain objects of hoards. Also a series of X-rays were made for the "nuclei" of objects not yet dismantled from the Tartaria I hoard. Certain objects were 3D scanned in order to obtain digital models used of high resolution. The resolution of the digital models allow to extract information about the processing/manufacturing techniques, as well as for other particular features of the objects' shapes. The physical and chemical data will be introduced in the PILOT platform of specialised databases, together with general information (history, location, description, typology etc.). Thus a complex set of data were obtained in order to be used for an integrated and multidisciplinary study of the two hoards from Tartaria.

This work was supported by a grant of the Romanian National Authority for Scientific Research, CNDI– UEFISCDI, project number 2013-4-1022.

09 VIKING AGE SWORDS STUDIED WITH NEUTRONS

Author: Professor Lindelof, Poul - Niels Bohr Institute; University of Copenhagen (Presenting author)
Co-Author: A. Fedrigo - University of Copenhagen - Instituto dei Sistemi Complessi - European Spallation Source ESS AB; A.R. Williams - The Wallace Collection; L. Jørgensen (deceased) - The National Museum of Denmark; Peter Pentz - The National Museum of Denmark; D. Bausenwein - Forschungs-Neutronenquelle Heinz Mayer-Leibnitz FRM II; B. Schillinger - Forschungs-Neutronenquelle Heinz Mayer-Leibnitz FRM II; F. Grazzi - Instituto dei Sistemi Complessi; K. Lefmann - Instituto dei Sistemi Complessi
Keywords: Vikings, swords, neutrons
Presentation Preference: Oral

The military successes of the people in Scandinavia in the Viking Age, the socalled Vikings, relied on their ships, but also relied on their excellent weapons. The most advanced weapon, they had, were swords, which were pattern-welded and build up of rods with different iron alloy compositions. Using neutron tomography and diffraction at the the FRM II research reactor in Garching, we have for the first time determined the 3-dimensional structure in detail of 3 selected Viking swords from the National Museum in Copenhagen.

10 CAPABILITIES, LIMITATIONS AND PERSPECTIVES OF STUDY OF ARCHAEOLOGICAL ITEMS MADE OF NON-FERROUS METAL BY MEANS OF NEUTRON TOMOGRAPHY

Author: Mr Kozlenko, Denis - Joint Institute for Nuclear Research
Co-Author: Mrs Saprykina, Irina - Institute of Archaeology Russian Academy of Sciences (Presenting author); Mrs Zelentsova, Olga - Institute of Archaeology Russian Academy of Sciences; Mr Khokhlov, Alexandr - Institute of Archaeology Russian Academy of Sciences; Mr Mimokhod, Roman - Institute of Archaeology Russian Academy of Sciences; Mr Kichanov, Sergey - Joint Institute for Nuclear Research
Keywords: archaeology, neutron tomography
Presentation Preference: Poster

Neutron tomography is a relatively new method for study of archaeological objects made of ferrous and non-ferrous metals. This method allows one to determine degree of preservation of an object, to identify its structural elements and features and etc. The difference in total cross section of neutron absorption for different elements allows one to visualize distribution of impurities and to obtain its three-dimensional model. This method is also employed in reconstruction of the manufacturing technique of studied objects, in determination of corrosion development sites and in visualization of individual elements inside of studied objects.Following objects were studied by means of neutron tomog-

raphy: a Sarmatian golden jar-vial from a Chebotarev-5 burial; an Old Russian silver jewelry from a Tver hoard (2014); a Viking period fibula from a Finno-Ugrian burial nearby ancient Murom. As a results of the study, niello and gilding parts were detected on a bracelet's surface from the Tver hoard of 2014 and the bracelet was referred to Kievan jewelry school; data of inner structural elements of a stellated kolt from the same hoard were obtained, which allowed us to reconstruct its manufacturing technique and assembly sequence. Good results were obtained for a golden jar as well – filling remnants were found inside of it; also, its structural elements and thickness of golden plate used for its manufacturing were determined; and etc.

11 IDENTIFICATION OF COPPER ISOTOPE FRACTIONATION DURING SMELTING WITH AN EXPERIMENTAL PROCESS-ORIENTED APPROACH

Author: Rose, Thomas - University Fankfurt (Presenting author)
Co-Author: Dr.-Ing. Morgenstern, Gunter - Technische Universität Bergakademie Freiberg, Institute for Nonferrous Metallurgy and Purest Materials; Prof. Dr.-Ing. Stelter, Michael - Technische Universität Bergakademie Freiberg, Institute for Nonferrous Metallurgy and Purest Materials; Prof. Dr. Klein, Sabine - German Mining Museum Bochum, Research Department for Archaeometallurgy
Keywords: Copper, smelting, archaeology
Presentation Preference: Oral

Today the advanced development of tools and methods in archaeometallurgy enables a more accu-rate reconstruction and understanding of ancient smelting techniques. Especially pyrometallurgical experiments allow to establish a secure link between ores and their smelting products. From the beginning of archaeometallurgical research the interest was focussed on copper metallurgy as copper is the oldest known metal to be smelted from ores.
The aim of this contribution is to push the research on copper isotope fractionation during the smelt-ing process. A series of smelting experiments with malachite and chrysocolla-dioptase-ores was conducted in a small induction furnace. Melt portions were continuously extracted during the ex-periments. Our new, process-oriented approach allowed for the first time to investigate the devel-opment of copper isotope fractionation during the smelting process. Additionally, the isotopic ho-mogeneity of a regulus was investigated.
Both series successfully revealed a variation of copper isotope ratios during the smelting process. Further, considerable deviations of copper isotope ratios in a profile through the regulus were iden-tified. Therefore our results show a significant fractionation of copper isotopes during the smelting process. We conclude that the direct comparison between ore and metal is not futile and a single analysis of an object is not sufficient to examine its bulk isotopic composition. In future experiments (reconstruction of prehistoric smelting technologies with sulphidic ores) these results will be further evaluated.

12 TRADITIONAL METAL CASTING OR COMPUTER BASED SIMULATION? A PRE-STUDY ON VIKING AGE BROOCHES

Author: Archaeologist Neiß, Michael - Uppsala University (Presenting author)
Keywords: Viking metal-casting experiments
Presentation Preference: Oral

In Scandinavian art , three-dimensional metal décor is a rare phenomenon before the Viking Age. Many theories were offered in order to explain the genesis of this new pictorial language. During this discourse, scholars tended to stress the importance of woodcarving as a source of inspiration for metal casters. However, one often neglects that casting and carving are different production techniques. This very fact might have posed an obstacle for a direct motif transfer. Therefore, it seems well-advised to investigate the technical conditions of three-dimensional casting before hypothetisizing on the mechanisms of motif transfer between different materials. The Viking Age penchant for the third dimension might be illustrated best through the development of certain relief brooches, which gradually turned into 'baroque shaped' extravaganzas. Considering all circumstances, baroque shaped brooches seem like ideal candidates for a case study concerning the implementation of three-dimensional casting. Instead of creating another unprovable hypothesis of motif transfer, we have the unique chance to see, how a narrow circle of Viking Age casters gradually advanced into the third dimension. Probably as a result of cire-perdue, archaeology has not yet been able to identify any molds for baroque shaped brooches that could provide us with further information about the manufacturing process. Hence, one must settle on remaining production traces in order to hypothesize about the original casting technique. 2010—2016, some hypotheses were tested in the context of experimental pilotstudies, based on traditional casting and on virtual casting simultations (employing MAGMASOFT software). As a result of these dynamic experiments, one is compelled to speculate that the Viking Age casters used a peculiar casting technique, that promoted the development of three-dimensional Animal Art as a kind of by-product . However, due to the limited scope of this pre-studies, our results need to be scrutinized within future experiments.

13 ARCHAEOMETALLURGICAL RESEARCH ON ESTONIAN BRONZE AGE METAL OBJECTS

Author: Paavel, Kristiina - University of Tartu (Presenting author)
Co-Author: Prof Kriiska, Aivar - University of Tartu; Prof Kirsimäe, Kalle - University of Tartu; Paiste, Päärn - University of Tartu
Keywords: Archaeometallurgy, ICP-MS
Presentation Preference: Oral

The amount of Bronze Age (1800–500 BC) bronze finds from Estonia has noticeably increased during recent years, and new analytical capabilities in the University of Tartu have allowed us to investigate them. The items were recently sampled for compositional analyses and lead isotope studies using ICP-MS. The research questions were rather classically related to the compositional groups and their variation in time, as well as between objects of typologically presumed different origin. Another set of questions dealt with the origin of the raw material, and the (in)visibility of recycling. ICP-MS is one of the most successful techniques currently available for elemental studies of copper alloys. Additionally, we have some results obtained a few years ago using SEM-EDS for exploratory analysis. Some objects have been analysed already in the 19th century. In the presentation I will offer preliminary results of the ICP-MS analyses and will discuss problems related to comparing results obtained using different analytical procedures.

14 THE ROLE OF METALS IN ARCHAEOLOGICAL GLASS. THE ARCHAEOMETRIC STUDIES OF THE METALLIC DECORATION ON PAINTED GLASS.

Author: Dr Miazga, Beata - University of Wroclaw (Presenting author)
Keywords: metals, X-Ray Fluorescence
Presentation Preference: Oral

Glass artefacts, especially when decorated can be degraded by several factors (e.g. in use). When deposition is in a wet environment a leaching of alkali glass components (sodium, potassium) takes place. The second process is the deposition of metallic ions from soil on the surface of artefacts, which can significantly change it. These phenomena

are particularly dangerous for decorated glass as the painted layers are often very delicate, disintegrate easily and need to be immediately preserved. Due to this, archaeometric studies of metals in paints are difficult, especially when non-destructive techniques are applied. The results of microscopic and spectroscopic (X-ray fluorescence) research of non-stable, partially preserved decorated glass from archaeological excavation are presented in this paper. The importance of various metals from glass bulk (calcium, magnesium) as well as from decoration (e.g. iron, copper, cobalt, gold, lead and tin) will be discussed in technological, economic and social contexts.

15 REGIONAL VARIABILITY IN IRON PRODUCTION TECHNOLOGIES IN 7-10TH CENTURIES EAST AFRICA

Author: (current PhD. Student) Bauzyte, Ema - Aarhus University (Presenting author)
Keywords: µXRF, iron, Swahili
Presentation Preference: Oral

The paper focuses on iron production technologies in East African 7-10th century sites, namely Kilwa, Dakawa, Tumbe, Kimimba, Unguja Ukuu, Fukuchani and Mkokotoni. Samples of iron slag have been obtained from these sites and a range of high resolution laboratory techniques are being employed to investigate chemical, mineralogical and isotopic composition of iron smelting and smithing debris. The paper will present the results of µXRF and reflected light optical microscopy analyses. The aim of the research is to reverse engineer iron manufacturing processes in these sites, compare and contrast them attempting to better understand iron production tradition across the East African region and particularly along the Swahili coast. The paper presents the preliminary results of the research and illustrates how laboratory techniques are beeing utilised to assess regional variability of iron production.

16 'HOW WONDERFUL THAT WE HAVE MET WITH A PARADOX, NOW WE HAVE SOME HOPE OF MAKING PROGRESS.' (NIELS BOHR).

Author: Dr Kuijpers, Maikel - Leiden University (Presenting author)
Co-Author: Dr. Braekmans, Dennis - Cranfield Forensic Institute, Cranfield University
Keywords: interpretative framework, theory
Presentation Preference: Oral

The development of progressively sophisticated and detailed analyses is obviously a worthwhile scientific endeavour of itself, but we need to keep in mind that better analytical techniques do not necessarily equal superior archaeological data.
For instance, many effects of certain elements on the properties of copper that metallurgists have laboriously recognised may not be directly applicable since the perceivable – and technological - effect is too small, or too unpredictable to be observed by prehistoric metalworkers, let alone associated with a specific type of ore or metal composition. This leads to an interesting conflict that increasing explicit knowledge of metal gained through archaeometallurgical analysis has the potential to become a disadvantage when exploring the material from a human perspective.
In this paper we argue that the very strength of new technologies, which often lies in better preciseness, accuracy and detail of its analyses, can become a potential pitfall when the data needs to be interpreted on the level of people, their choices and their technological actions. Paradoxically, it seems that sometimes we know too much, in too much detail. Ultimately, a new interpretative framework for archaeology and exact scientific data is sometimes required.

414 RICHES FROM DISTANT LANDS - TRANSFER AND PERCEPTION OF PRESTIGE GOODS

Theme: 6. Interpreting the archaeological record
Author: Rácz, Zsófia (Hungary) - Eötvös Loránd University
Co-Author(s): Hilgner, Alexandra (Germany) - Römisch-Germanisches Zentralmuseum, Leibniz-Forschungsinstitut für ArchäologieKoncz, István (Hungary) - Eötvös Loránd University, Institute of Archaeological Sciences
Keywords: trade, prestige goods, 'exotic' materials
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Long-distance trade and the exchange of goods and ideas between Europe, Asia and Africa and the access to these played an important role in the representation of social inequality during Pre- and Early History. By nature in the focus of these contacts covering vast areas and multiple regions are raw materials, luxury items and technologies – usually interpreted as or connected to prestige goods.
The role of gemstones, ivory and other special raw materials and finished products as well can be examined in connection with long-distance trade, from a stylistic and symbolic aspect or as indicators of status and prestige. The idea and perception of these goods and the technology of processing or producing them also serves as evidence for the existence of cross-cultural contacts.
New scientific methods and the cooperation of experts from different scientific fields raise new questions and at the same time make possible to give an answer to long standing problems. The study of the provenance of raw materials, the dynamics and change of long-distance trade routes or the subjects of trade (raw material or products) are of particular interest. Also the possible social meaning of these „riches from distant lands" will be discussed through certain case studies from different time periods and regions. As a central topic of our session results of the project „International Framework – Weltweites Zellwerk" will be presented on the cultural and economic meaning of garnet in the Early Middle Ages (https://zellwerk.hypotheses.org/).

01 THE GARNET REALM – THE USE OF RED GEMSTONES IN EARLY MEDIEVAL EUROPE

Author: M.A. Hilgner, Alexandra - Römisch-Germanisches Zentralmuseum (Presenting author)
Co-Author: Dr. habil. Quast, Dieter - Römisch-Germanisches Zentralmuseum
Keywords: garnet, early medieval
Presentation Preference: Oral

Within the interdisciplinary joint project "Weltweites Zellwerk – International Framework" the social and symbolic meaning of a special kind of gemstone was analysed: the red garnet. This paper will focus on current results.
Garnet was very popular in the early medieval period (5th – 8th century) and was used to decorate surfaces of dress accessories and weapon fittings in a manner resembling mosaics. This so-called cloisonné style became popular in the 5th century, although in the beginning, only on prestigious objects. These were connected almost exclusively

with a male military fashion. It is more than probable that those objects were produced in the eastern part of the Roman Empire and reached the Barbaricum as gifts to local elites, where the style was quickly adapted and interpreted. In the 6th century, cloisonné was common everywhere in the Frankish world, although in lower quality, becoming additionally part of the female dress. Chemical analyses allow us to differentiate the source of the garnet raw material and we know today that these 5th – 6h century garnets came almost exclusively from Indian and Sri Lankan sources. Afterwards, garnet was used on liturgical objects and Christian symbols – garnet itself seems to be connected with Christian meanings (the blood of Christ?). Starting at the end of the 6th century, there was a massive disruption in the supply of garnet, on the one hand leading to a decline of the cloisonné style – especially on mass-products – on the other bringing forth some very few high-quality objects. This discontinuity could be explained by political changes in the area of the Gulf of Aden. The lack of garnet in early medieval Europe led eventually to the use of red substitutes, recycling of older gems and half-finished, "empty" objects.

02 RED GARNET AND FURTHER EXOTIC IMPORTS IN THE MEROVINGIAN KINGDOMS

Author: Dr. Drauschke, Jörg - Römisch-Germanisches Zentralmuseum (Presenting author)
Keywords: Merovingians, Mediterranean, exchange
Presentation Preference: Oral

Recent publications dedicated to the period of transformation between Antiquity and the Early Middle Ages tend to emphasise the end of Roman civilisation and the loss of cultural complexity in the new "Barbarian" kingdoms. Looking at northern Gaul and the rising Frankish Kingdom the evidence for Mediterranean amphoras and fine wares as markers of international exchange connections expires indeed at the beginning of the 6th century. But at the same time different object groups are able to show continuous relations with even distant regions. Among them is the red garnet that reached northern Gaul as decoration of precious objects produced in the Mediterranean. First of all the grave goods from the burial of Childeric (+ 481/82) must be mentioned, but also other belt buckles with garnet cloisonné. Further imports from the Mediterranean complete the picture for the early Merovingian period around 500 AD. Although the red garnet was used in locally produced jewellery, too, it seems that especially the cloisonné style had a particular impact on the local production and so at the beginning of the 6th century the use of garnet is intensified suddenly, visible for example in the distribution of disc brooches with garnet cloisonné. It is not bound anymore to members of the elite, but seems to reach also different social groups.
Whereas the import of finished products with garnet cloisonné from the Mediterranean decreases a new phase of heavy inflow of Mediterranean and oriental objects begins around the middle of the 6th century including e. g. cowrie shells from the Red Sea, ivory from Africa, amethyst beads from the eastern Mediterranean and of course red garnet from India and Sri Lanka. Mediterranean imports mentioned in written sources complement the picture and give some hints concerning their perception in Frankish Gaul.

03 ANIMALS IN EARLY MEDIEVAL GIFT-EXCHANGE

Author: Prof. Dr. Hardt, Matthias - GWZO (Presenting author)
Keywords: Animals, gift-exchange, prestige-goods
Presentation Preference: Oral

Early medieval kings, princes, and other rulers were connected by a system of gift-giving, which was used to create and to change hierarchies between them. As gifts were given not only prestige-goods as ornaments, gold, silver, or precious stones, but exotic animals as well. The most famous example is the elephant Abul Abaz, given by the caliph Harun ar-Raschid to Charlemagne in the first years of the ninth century. On the basis of written sources the lecture deals with animals as prestige goods from distant lands in the first millenium AD.

04 WHERE DID THE ELEPHANTS COME FROM? IVORY IN CONTEXT FROM THE 6-7TH CENTURY CARPATHIAN BASIN

Author: Koncz, István - Eötvös Loránd University, Institute of Archaeological Sciences (Presenting author)
Keywords: ivory, trade, prestige
Presentation Preference: Oral

The ivory game pieces found at the site of Mosonszentjános-Homokbánya (Győr-Moson-Sopron County, Hungary) are unique to the 6th century Carpathian Basin in respect of their design and choice of material. Although only a few close parallels are known from England and Italy, many gaming sets were found in prominent burials across Europe from the 6–7th century. The context of the artefacts and their craftsmanship presume that the game pieces of Mosonszentjános were of high value, which is in line with the image of the use of ivory as „prestige" material. But not all the artefacts made of ivory came from such an illustrious context, nor are they results of outstanding craftsmanship. So where and most importantly how did the ivory come from? Was it imported as a raw material and the few artefacts made of it manufactured in the Carpathian Basin or did they import the finished products from Western European or Mediterranean workshops?

05 THE PEOPLE FROM THE BLACK MOUNTAINS: AGENCY AND THE TRANSFER OF GOODS BETWEEN MESOPOTAMIA AND THE INDUS VALLEY

Author: Ms Lume Pereira, Federica - Heidelberg University (Presenting author)
Keywords: Mesopotamia, Indus, elite
Presentation Preference: Oral

Ethnographically, the lure of distant lands and their fabled wealth has long been a powerful incentive for men and women to explore the unknown (Helms 1988). The fascinating long-distance contacts that developed between Mesopotamia, its eastern neighbours, and the Indian subcontinent in the 3rd millennium BC have long been subject of research (Ratnagar 2004; Potts 1994). Textual sources, as well as archaeological evidence show that precious woods and metals, ivory and gemstones amongst other exotic and rare goods were transported via sea and land within networks that spanned the oases of Central Asia, the Indus Valley domains, the Iranian plateau, the coast of the Persian Gulf and Mesopotamia. The mostly unidirectional transfer (from East to West) presented by the archaeological record has given rise to the notion that these exotic goods were esentially prestige goods needed by Mesopotamian elites to strengthen their status; such a display being particularly visible in the royal cemetery of Ur (Zettler and Horne 1998). The careful selection and elaborate extraction of raw materials and the sophisticated techniques employed in manufacturing centres of the Indus Valley region (Kenoyer and Vidale 1991) have further cemented the view that this exchange was not only state-organized, but also not a profit-oriented enterprise (Ratnagar 2016).
New archaeological evidence can now be combined with a growing number of scientific studies concerning the manufacture and movement of materials, as well as people (Kenoyer et al. 2013; Pugach et al. 2013; Re et al. 2011). Drawing on this varied data this paper will reflect on the agency of elites and the role of craftsmen within these vast exchange networks, by taking into consideration recent scholarship concerning the role of interstitial spaces and contact zones (Frachetti 2012; Cornell 2007).

06 GARNET OBJECTS AS PRESTIGE GOODS IN THE AVAR PERIOD OF THE CARPATHIAN BASIN

Author: Dr Rácz, Zsófia - Eötvös Loránd University, Institute of Archaeological Sciences (Presenting author)
Keywords: garnet, Avars, elite
Presentation Preference: Oral

The 7th century was the last phase during the Early Middle Ages from which garnet stones appeared in the archaeological material of the Carpathian Basin. The garnet objects came exclusively from burials of the regional elite.The 'red stones' used in this period are of various – Indian, Sri Lankan or European – provenance and are inlaid in high quality precious objects with unique technological and stylistic characteristics. The majority of this jewelry was import product and arrived as diplomatic gift, maybe as booty, or via various personal contacts at the Carpathian Basin. The far-reaching network of connections are due to the specific political and geographical situation of the Early Avar Khaganate: it represented a new power structure on the border of Byzantium, Western and Eastern Europe. Intensive foreign connections aided the Avars in acquiring not only the products of Mediterranean and Merovingian elite workshops, but at times also the necessary technological ingenuity to produce them. This paper focuses on some particular examples of elite burials with garnet objects and try to find out a story behind them: where the garnet objects were produced, how they got to the Avars and what kind of 'fate' they had in a changed milieu.

07 GARNET PROVENANCE AND SUPPLY ATTESTED BY THE ARCHAEOMETRIC INVESTIGATION OF POLYCHROME FINE METALWORK FROM THE AVAR PERIOD CARPATHIAN BASIN

Author: PhD Horváth, Eszter - Eötvös Loránd University Budapest Institute of Archaeological Sciences Department of Archaeometry and Archaeological Methodology (Presenting author)
Co-Author: Bendő, Zsolt - Eötvös Loránd University Budapest Institute of Geography and Earth Sciences Department of Petrology and Geochemistry; PhD Váczi, Tamás - Eötvös Loránd University Budapest Institute of Geography and Earth Sciences Department of Mineralogy
Keywords: garnet, provenance, supply
Presentation Preference: Oral

Through the project International Framework – Weltweites Zellwerk we have been placed in the fortunate situation that allows us the systematic archaeometric processing of garnet jewellery from the Avar Period Carpathian Basin. The investigated 30 examples of late 6th-7th century fine metalwork with garnet inlays are essentially without exception the most impressive first-class finds produced using extraordinary raw materials and techniques in gem-cutting and metalwork. Disproving earlier assumptions, our analytical data show that the usage of garnets of South Asian and European provenances overlaps chronologically to a greater extent, and a sudden change cannot be displayed. Indian and Sri Lankan garnets, characteristic of the 5th as well as early and mid-6th century polychrome artefacts, were dominantly utilised until the last third of the 7th century.

Regarding the supply of the exploited gemstones, our results show the importance of long distance trade still in this late period of garnet ornamentation. The gem-cutting workshops may have retained direct connections with the already known South Asian source regions. On the other hand, indirect signs indicate the stockpiling of previously exploited garnets in depots or treasuries. The majority of objects with mixed garnet populations supports the conclusion that the stones were supplied and distributed in a centralised manner.

The garnet inlays mostly came to our region in two different conditions: set in import goods and ready to be set in the case of locally manufactured objects. In the latter case, the gem itself was certainly the object of the trade. Considering that the garnets came to the Carpathian Basin not directly from the geological sources but from distribution centres or workshops, the significance of our results may have a more general validity for all of Europe.

416 UPPER PALAEOLITHIC IN THE CENTRAL EUROPE: NEW IDEAS AND PERSPECTIVES

Theme: 6. Interpreting the archaeological record
Author: Wilczyński, Jarosław (Poland) - Institute of Systematics and Evolution of Animals, Polish Academy of Science, Kraków, Poland
Co-Author(s): Lengyel, György (Hungary) - Department of Archaeology and Prehistory, University of Miskolc, Hungary
Keywords: Upper Palaeolithic, Central Europe, Pleistocene
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

The main objective of proposed session is to discuss current issues in the field of the Upper Palaeolithic(UP) of widely defined Central Europe. Our chronological perspective cover the appearance of the Anatomically Modern Human and coincides with the peopling of this region by Magdalenian societies. Our session not only aims to discuss the new materials linked with Early Upper Palaeolithic and the main cultural units such as the Aurignacian, Gravettian or Magdalenian, but also take care of the poorly recognized problem of UP settlement attributable after the Last Glacial Maximum; in particular issues related with the Epigravettian and question of the Epiaurignacian. In this session we welcome approaches connected strictly with archaeological record (technology, typology) but also combining multidisciplinary data, in particular deriving from archaeozoological, environmental, spatial, or chronological studies.

01 THE EARLY UPPER PALAEOLITHIC ALONG THE MIDDLE DANUBE: AN OVERVIEW AND NEW RESULTS FROM THE EASTERN CARPATHIAN BASIN

Author: Dr. Chu, Wei - University of Cologne (Presenting author)
Keywords: Aurignacian, Paleolithic, AMH
Presentation Preference: Oral

Early Upper Paleolithic sites in the Danube catchment have been put forward as evidence that the river was an important conduit for modern humans during their initial settlement of Europe. Central to this model is the Carpathian Basin, a region covering most of the Middle Danube. Because the archaeological record of this region is still poorly understood, this paper aims at providing a contextual assessment of the Carpathian Basin's geological and paleoenvironmental archives starting with the late Upper Pleistocene. It then reports some recent excavations of Aurignacian sites in the Northern (Slovakia) and Eastern Carpathians (the Banat). It then uses this data to test whether the relative absence of Early Upper Paleolithic sites is obscured by a taphonomic bias.

02 THE UPPER AURIGNACIAN HORIZONS OF HOHLE FELS CAVE (SOUTHWESTERN GERMANY) – A FUNCTIONAL VARIANT OF THE SWABIAN AURIGNACIAN?

Author: Dr. Bataille, Guido - Eberhard Karls Universitaet Tuebingen (Presenting author)
Co-Author: Prof. Ph.D. Conard, Nicholas J. - Eberhard Karls Universitaet Tuebingen
Keywords: Aurignacian, bladelet technology
Presentation Preference: Oral

Here we present preliminary results of the technological variability of the Swabian Aurignacian on the example of the Aurignacian stratigraphy of Hohle Fels Cave.
Current technological investigations at Hohle Fels highlight the importance of multiple burins as bladelet cores, comprising carinated, busked, dihedral and burins on truncation. The preparation of narrow edges as reduction faces, often on blades, resulted in the manufacture of small and narrow blanks. Knappers produced these blanks from burin-cores, as well as flat carinated and nosed end-scrapers. The lack of carinated cores in AH IIIa and IV highlights the techno-functional diversity of the Swabian Aurignacian. It contrasts with horizons AH II and III of Geißenklösterle and AH IV and V of Vogelherd in which bladelet production from carinated endscrapers is frequent (e.g. Hahn, 1988; Conard & Bolus, 2006). Thus, the investigated horizons from Hohle Fels represent a specific and previously not described variant of the Swabian Aurignacian. Future research will help to clarify whether a chronological disparity or functional reasons are responsible for the differences in bladelet production. For the moment, absolute dating of Aurignacian horizons of Geißenklösterle and Hohle Fels indicate the co-existence of technological varieties and thus contradict a chronological interpretation. Despite the differences in bladelet production, the typological composition of the Hohle Fels lithic and organic industry is comparable to the other assemblages of the Swabian Aurignacian.

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03 THE EARLY GRAVETTIAN OF HOHLE FELS CAVE AND THE POSSIBILITY OF AN IN SITU DEVELOPMENT OUT OF THE AURIGNACIAN

Author: Dr. Taller, Andreas - Tübingen University (Presenting author)
Co-Author: Prof.Ph.D. Conard, Nicholas J. - Tübingen University
Keywords: Gravettian, Swabia, Aurignacian
Presentation Preference: Oral

The three Mid-Upper Palaeolithic layers of Hohle Fels Cave (Ach Valley, Swabian Jura) yielded comparably early dates from 31 up to 35 ka cal BP and contain a fully developed Gravettian industry (Conard & Moreau 2004; Taller & Conard in press.). The dates are in agreement with the situation at nearby Geißenklösterle, where the Gravettian is of similar, and probably even higher age (Higham et al. 2012). Moreover, the dates from Aurignacian and Gravettian directly succeed each other without any nameable gap in Hohle Fels as is the case in Geißenklösterle.
Two layers with relatively few finds separate the Gravettian from the underlying Aurignacian. These layers contain lithic assemblages that are ambiguous and show elements of the Gravettian as well as the Aurignacian. Recent studies revealed however, that these horizons most likely represent mixed assemblages as a result of taphonomic processes. In spite of this, a principal assignment of the lower of these two layers to the Aurignacian and of the upper one to the Gravettian was suggested (Taller & Conard in press.).
This means that based on chronological and stratigraphical findings a continuous settlement in Hohle Fels from Aurignacian through to the Gravettian is well possible. Thus the site is well suited to test hypotheses regarding the origins of the Gravettian.
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Taller, A.; Conard, N.J. in press: Das Gravettien der Hohle Fels- Höhle und seine Bedeutung für die kulturelle Evolution des europäischen Jungpaläolithikums. Quartär 63.

04 RECENT RESEARCH ON THE UPPER PALAEOLITHIC IN ISTRIA, CROATIA

Author: Dr. Jankovic, Ivor - Institute for Anthropological Research, Zagreb (Presenting author)
Co-Author: Komšo, Darko - Archaeological Museum of Istria, Pula; Barbir, Antonela - Croatian Conservation Institute, Zagreb; Dr. C.M. Ahern, James - Department of Anthropology, University of Wyoming; Dr. Becker, Rory - Department of Anthropology and Sociology, Eastern oregon University; Dr. Weinstock, Jacobo - Faculty of Humanities, University of Southampton
Keywords: Pleistocene, Palaeolithic, Croatia
Presentation Preference: Oral

As a part of the project „Archaeological Investigations into the Late Pleistocene and Early Holocene of the Lim Channel, Istria (ARCHAEOLIM)" financed by the Croatian Science foundation (Grant no. 7789), archaeological excavations have been undertaken on four sites Two yielded material from the Paleolithic. At Romualdo's Cave previous researchers found traces of the Upper Paleolithic industry and two human teeth, and later several artefacts that could be assigned to Mousterian industry. Our work resulted in discovery of faunal remains and lithic finds from Upper Pleistocene. While the Upper Paleolithic finds were rare (only a few lithic finds can be securely assigned to this period) there is evidence of human occupation of the site during the Middle Paleolithic. At Abri Kontija 002 archaeological work resulted in a very rich, and what seems to be either frequent or continuous human presence during the Upper Paleolithic. All excavated layers are very rich in faunal remains, lithics, and traces of fire and other finds. Here we discuss the main finds from three excavation seasons.

05 TRENČIANSKE BOHUSLAVICE GRAVETTIAN SITE REINTERPRETED, VÁH VALLEY, WESTERN SLOVAKIA

Author: Lengyel, György - University of Miskolc (Presenting author)
Co-Author: Nemergut, Adrián - Slovak Academy of Sciences; Žaár, Ondrej - PamArch; Wilczyński, Jarosław - Institute of Systematics and Evolution of Animals of the Polish Academy of Sciences
Keywords: Gravettian, Central Europe
Presentation Preference: Oral

Trencianske Bohuslavice Gravettian site, Váh valley, Western Slovakia, was excavated in the 1980s by Juráj Bárta. The archaeological assemblage consisted of knapped lithic tools, animal remains, and pierced pendants made of quartzite pebbles. The uniqueness of the material was the copresence of bifacial leaf points and the Gravettian artifacts, which was the first clear evidence for bifacial technology in the Gravettian of Central Europe. However, the lithic assemblage was recovered from two excavation areas situating 50 meters away from each other, and Bárta never specified in his publications which area yielded the bifacial tools. Recent studies on the lithic assemblages found that the bifacial points were recovered at area B and the Gravettian artifacts at area A. This could straightforwardly mean that the bifacial tools are not part of the Gravettian assemblage. Our lithic studies points out that even in this circumstance there is a great chance that the assemblage belongs to the same cultural phenomenon.

06 VARIATIONS AND CHANGES OF THE UPPER PALAEOLITHIC BLADE TECHNOLOGY IN THE REGION OF BÜKK MOUNTAINS, HUNGARY

Author: Szolyák, Péter - Herman Ottó Museum (Presenting author)
Keywords: technology, LGM, Gravettian
Presentation Preference: Oral

It is a general feature in the region of Bükk Mountains that the blade cores as the evidences of blade technology are absent from the prominent Upper Palaeolithic cave sites (Szeleta, Istállóskő, Peskő), almost entirely. There is a well-marked exception, Herman Ottó Cave, where the ratio of blade and bladelet cores is relatively high (2.3%). Although researchers proved the presence of the (Evolved) Szeletian, Aurignacian (I and II) and Gravettian in the mentioned assemblages, mainly by the tool kits, stratigraphy and absolute chronology, the image of the regional Upper Paleolithic cannot be completed without studying all elements of the chaîne opératoire. In the last decade, besides the Herman Ottó Cave, several open-air sites (Miskolc-Molotov St., Miskolc-Harsányi elágazás, Miskolc-Kis-föld) provided abundant assemblages to review the regional UP blade technology and the intercourses between archaeological cultures. Taking into account the climatic and environmental conditions and raw material processing, the differences between technological approaches to the blade productions of the periods before, during and after the Last Glacial Maximum can be demonstrated.

07 FUEL PROCUREMENT DURING THE UPPER AND LATE PALAEOLITHIC IN POLAND

Author: Dr Moskal del-Hoyo, Magdalena - W. Szafer Institute of Botany, Polish Academy of Sciences, Lubicz 46, 31-512 Kraków, Poland
Co-Author: Dr Wilczynski, Jaroslaw - Institute of Systematics and Evolution of Animals, Polish Academy of Sciences; Sławkowska 17, 31-016 Kraków, Poland; MSc Stefański, Damian - Paleolithic and Mesolithic Department, Archeological Museum In Kraków, Senacka 3, 31-002 Kraków, Poland (Presenting author)
Keywords: anthracology, fuelwood, hunter-gatherers
Presentation Preference: Oral

Hunters and gatherers of the Upper Palaeolithic were highly dependent on the natural environment. This also applies fuel supply used for fireplaces, which was determined primarily by the availability of a particular type of fuel in the close neighborhood of the sites. The evidence of long-lasting and repeated visits of Early Upper Palaeolithic hunter-gatherers groups in the Kraków region would mean that climatic conditions were relatively stable and favorable for settlement and for a woodland development. A study of fireplaces with fuelwood remains from various archaeological sites dated to the Interpleniglacial, support this idea, indicating that there were at least sparse clusters of trees in the vicinity of these sites. Such situation was not detected in the case of the slightly younger, Gravettian sites dated to the beginning of the Pleniglacial, where only bone of large mammal specimens were used as a fuel in fireplaces. This was the result of a significant cooling of the climate (the Last Glacial Maximum) that caused a considerable reduction in woodland vegetation. This situation changed during the Late Glacial and the Final Palaeolithic, when the gradual warming was observed and firewood from local woodland was collected again. In present study, we would like to discuss the results of our research concentrated on fuel procurement during the Upper and Late Paleolithic of southern Poland. In case of fuelwood, we focus on the description of trees and shrubs species as well as a quality of the fuel used in fireplaces (e.g. deadwood, branchwod) to infer not only a selection criteria among the Palaeolithic groups, but also climatic conditions around the sites. In addition, in the light of radiocarbon dating results, we want to highlight the importance of a taxonomic identification of fuelwood prior to 14C measurements in order to detect some taphonomic problems.

417 JOURNEYS, DRIFTS AND ENCOUNTERS : EXPLORING THE BOUNDARIES OF MATERIALITY.

Theme: 6. Interpreting the archaeological record
Author: MacGregor, Gavin (United Kingdom) - Northlight Heritage
Co-Author(s): Synnestvedt, Anita (Sweden) - Göteborgs Universitet
Keywords: Transformation, Facilitation, Co-production, Discourse, Collaboration
Presentation Preference: Walk through Maastricht

Archaeology, situated in a nexus of social, cultural, political, economic and environmental dynamics, faces a range of significant challenges and opportunities which requires transformation of the relevance and reach of the discipline. As part of such a transformation, new models and methods of engagement and co-production are increasingly important. This requires opportunities for practitioner to explore and experiment, and to extend the boundaries of their practices. This can be through other modes of discourse (e.g. visual art, performance, music, craft) and / or through facilitating new forms and rhythms of collaboration.

From this perspective, we propose a session which may help practitioners commence a journey to begin to explore and go beyond the boundaries of their practice. We will facilitate a process for active participation, in the lead up to, journey to, and drifts and encounters through Maastricht. We propose the session will comprise activities in the wider city, culminating in a group based session in the conference space.

We seek expressions of interest from those who wish to participate in co-producing response(s) to 'Journeys, Drifts and Encounters'.

418 INTEGRATIVE BIOLOGY AND ARCHAEOLOGICAL REMAINS

Theme: 4. The 'Third Science Revolution' in Archaeology
Author: Sholts, Sabrina (United States) - Smithsonian Institution, National Museum of Natural History
Co-Author(s): Wärmländer, Sebastian (Sweden) - Division of Biophysics, Stockholm University; Cotsen Institute of Archaeology, UCLA, USARannamäe, Eve (Estonia) - Department of Archaeology, University of Tartu, Estonia
Keywords: Bioarchaeology, zooarchaeology, stable-isotopes, ancient-DNA, 3D-morphology
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Biochemical analysis of organic materials has provided archaeologists with an increasing wealth of information including genomic and proteomic data, stable isotope profiles, and trace element concentrations. In this session we welcome papers where analysis of biological materials (bone and teeth, soft tissues, and residues from humans or animals) is used to investigate archaeological questions related to any time period and geographic region. We welcome in particular interdisciplinary research that integrates multiple analytical techniques to study aspects of health, disease, and environment. Papers addressing methodological challenges and/or advances are always encouraged, even when the outcome is less successful. In order to increase communication between researchers we encourage all papers to be presented assuming a non-specialist audience.

01 TO RENDER THE CORPSE: IDENTIFYING EVIDENCE OF QUICKLIME APPLICATION IN HUMAN REMAINS

Author: Dr Sholts, Sabrina - Smithsonian Institution (Presenting author)
Co-Author: Dr Dudar, Chris - Smithsonian Institution; Ms Wallin, Cecilia - Stockholm University; Dr Billeck, Bill - Smithsonian Institution; Dr Wärmländer, Sebastian - Stockholm University
Keywords: Quicklime, adipocere, spectroscopy
Presentation Preference: Oral

Mortuary treatment is a universal practice with countless variations among different cultures throughout human history. Sometimes chemicals are used in postmortem treatment of the deceased to achieve various effects. Quicklime (calcium oxide, CaO) has long been used to speed decomposition, reduce putrefaction, discourage scavenging, and facilitate disinfection of corpses. Under some conditions, however, quicklime application can slow down decay and even preserve soft tissue. In contact with water, quicklime forms calcium hydroxide in an exothermic reaction that releases large amounts of heat and creates a highly alkaline environment. Over time the calcium hydroxide then reacts with carbon (usually as carbon dioxide) to form common calcium carbonate, which adheres to the skeleton as a white residue where the quicklime has been applied. Yet not all calcium carbonate present on skeletons has originated from quicklime: as a common component of soil, calcium carbonate often deposits on the surface of buried human remains as part of natural taphonomic processes. Furthermore, not all white residues found on skeletal material are calcium carbonate. Thus, the taphonomic presentation of quicklime and other postmortem deposits can be similar in appearance and difficult to identify. In this study, we examined several historic cases of human remains where quicklime has been documented, using a combination of analytical techniques of scanning electron microscopy (SEM), energy-dispersive x-ray spectroscopy (EDS), and infra-red (IR) and nuclear magnetic resonance (NMR) spectroscopy. This integrative approach allowed us to characterize and differentiate quicklime product from other materials with a similar appearance that can adhere to human remains, such as adipocere and acrylic casting residue, and demonstrate the interpretive challenges of making a qualitative determination between them. This work has relevance for both archaeology and forensic anthropology, where the circumstances of disposal are important for a broader reconstruction of past behavior and events.

02 A BULLET IN THE SPINE: HEALED GUNSHOT WOUND FROM MEDIEVAL AND EARLY MODERN ST JACOB´S CHURCHYARD IN TARTU, ESTONIA

Author: Malve, Martin - Institute of History and Archaeology, Department of Archaeology, University of Tartu, Tartu, Estonia (Presenting author)
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Keywords: Osteoarchaeology, paleopathology, gunshot
Presentation Preference: Oral

In 2014 a large scale rescue excavations took place on the Medieval and Early Modern St Jacob´s churchyard in Tartu, Estonia. Altogether 600 human skeletons were unearthed and subjected to osteological analysis. This remains provided abundant information about life and death in Medieval and Early Modern town of Tartu. One skeleton of a middle aged male showed rare case of trauma. Burial is dated to the time of Great Northern War (1700–1721) when Tartu was conquered by the Russian troops.
During osteological analysis a metal fragment was found inside the spinal process of the first lumbar vertebra. XRF analyses were carried out on the bone, which showed that the foreign substance was a lead piece. Most probably it is a lead bullet from a musket. How did this individual survive the trauma and how was his life affected? How did his skeleton respond? Besides the trauma, several pathologies were documented on the skeleton (e.g. Schmorl´s nodes, healed fractures and osteoarthrosis), which help shed the light on these issues.

03 SEXUAL DIMORPHISM IN FRONTAL BONE ROUNDNESS QUANTIFIED BY A NOVEL 3D-BASED AND LANDMARK-FREE METHOD

Author: Dr. Wärmländer, Sebastian - Stockholm University (Presenting author)
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Keywords: 3D-CT skull morphometrics
Presentation Preference: Oral

In this study we present a novel and landmark-free method for quantifying shape differences between male and female frontal bones. CT scans were recorded for 80 male and 80 female Turkish hospital patients, age 25–40. The frontal bones were first isolated from the 3D models by digital cutting along the bordering sutures, and then aligned to a CAD-based sphere. This allowed us to quantify the amount of frontal bone overlapping with the sphere (on average 43.2 [?] 6.5% for males and 33.9 [?] 6.6% for females, the difference is significant at $p < 0.0001$), and to identify areas of shape difference and deviation from the sphere surface in male and female bones. The larger proportion of spherical frontal bone surface in males challenges the common description of the female forehead as "rounder". Based on the overlap data, we developed discriminant functions able to correctly classify 77.5% of the frontal bone models as male/female. This demonstrates that 3D-based and landmark-free approaches to statistical shape analysis may become a viable alternative to the currently dominating landmark-based approaches for shape investigation.

04 CRANIOFACIAL FEATURES AND DENTAL NON-METRIC TRAITS IN NOTHERN SELKUPS FROM KIKKI-AKKI BURIAL GROUND (WESTERN SIBERIA XVII-XIX CENTURIES A.D.)

Author: Dr Zubova, Alisa - Peter the Great Museum of Anthropology and Ethnography (Kunstkamera), Russian Academy of Sciences; Institute of archaeology and ethnography SB RAS (Presenting author)
Co-Author: Poshekhonova, Olga - Institute of the problems of Northern development SB RAS
Keywords: Siberia, bioarcheology
Presentation Preference: Oral

Northern Selkups is one of the least studied indigenous groups of Western Siberia people. Linguistically they belong to the Samoyed branch of the Uralic group of languages. The area of their living includes the upper part of the river Taz basin and places, adjacent to the left tributary of Yenisey river – the Turukhan river. Northern Selkups have moved from the river Ob' basin to this region only in XVII century, so their material culture is complex. In addition to the main south selkupian component, there are also elements, assimilated from Eastern Khants, Kets and Evenks living nearby. The main goal of the research was the comparison of dental non-metric traits and cranial metric features of North selkups buried on the Kikki-Akki cemetery with modern Ugric and Samoyed samples. Dental data showed the close affinities of the Kikki-Akki group with Northern Selkups living now near the Taz river and their significant difference from the South Selkups of XVII – XIX centuries. This evident that the despite on the recent time of the Northern and Southern Selkups separation, geographical isolation and a high level of inbreeding can led to very rapid formation of biological differences. Craniofacial data showed the similarity of the Kikki-Akki group not only with selkupian samples from the Tym river but also with the Eastern Khants.

05 ARCHAEOZOOLOGICAL ANALYSIS ON THE TRACK OF ENVIRONMENTAL CHANGES OF EARLY MEDIEVAL FORTIFICATION AT POHANSKO

Author: Mgr. Dreslerová, Gabriela - Masaryk University (Presenting author)
Keywords: Early-Medieval, wild-animals, environment
Presentation Preference: Oral

The Great Moravian fortified centre at Pohansko near Břeclav is excavated since 1959. From more than fourteen hectares of excavated area and from more than thousand archaeological features comes extensive collection of animal bones and. Large, urbanized, densely populated settlement was divided into three main areals: Central fortified area and two baileys. In the central area was separately fortified Princely residence, craftsman area and other yards without defined specific function. The basic question is how are these areas different from the perspective of meat diet? Observed results suggest that species variability is connected rather with timeline than with social status. Main indicator of difference between the areas from the 9th century and from the 10th century, when fortified settlement does not exist, lies in the significant increase in the proportion of wild animals, especially wild boar and beaver (deer and roe-deer are in smaller amounts). Compared to areals from the 9th century, where wild animals bones are represented by only a few percent (max 3%), objects from the 10th century contains up to 20% of the bones of wild animals! Beaver together with wild boar have partly different and partly common demands on the environment, especially they both need forest vegetation. If we assume that in the 9th century was Pohansko densely populated and surrounding area was extensively exploited and used for agriculture, so there was a lack of living space and conditions for wild animals and also minimal chance for inhabitants to hunt them. When due to social, economic or political influence was Pohansko mostly abandoned and partly relocated. Settlement remains only in the part of area. Population decline allow forest succession and therefore return of the wild animals that was than more accessible and hunted for food and in the case of beaver for fur or sebum.

06 OLD DOGS AND NEW TRICKS: WHEN ZOOARCHAEOLOGY JOINS PALAEOGENETICS TO SHED LIGHT ON MAN'S BEST FRIEND EARLY HISTORY IN EUROPE.

Author: TRESSET, Anne - UMR 7209, Archéozoologie, Archéobotanique, Sociétés, Pratiques, Environnements MNHN-CNRS-SUs, 55 rue Buffon 75005 Paris, France (Presenting author)
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Keywords: Archaeozoology, Palaeogenetics, Neolithic
Presentation Preference: Oral

Old dogs and new tricks: when zooarchaeology joins palaeogenetics to shed light on man's best friend early history in Europe.

Morgane Ollivier*, Anne Tresset*, Stéphanie Bréhard, Adrian Balasescu, Christophe Hitte, Marjan Mashkour, Jean-Denis Vigne

* These co-authors contributed equally to this presentation

Recent studies, articulating molecular (mt and nuclear aDNA) and archaeozoological data, have brought new elements on the prehistory of the dog (Canis familiaris Linnaeus 1758) in Europe between ca. 13 000 and ca. 4000 cal. BP. Here, we present new data on the phenotypic and genotypic transformations triggered by the domestication and/or by early human selections. We identified coat colour variations, that we could highlight in dogs dated to ca. 10 000 years ago or size decrease, partially determined by genetic mutations that we found in dogs dated to ca. 7500 years ago. We also pinpoint transformations in genes involved in metabolism and enhancing amylase production, an enzyme capable of breaking down complex carbohydrates such as starch. This transformation appeared during the Neolithic, in dogs that were living in agrarian contexts and for which it provided an important selective advantage, as they could feed primarily on human waste, namely coming from cereal and pulse cultivation.
Molecular data also allowed us to thoroughly trace the circulation of dog populations from South-West Asia to and across Europe and we could show that this was tightly linked to two important human migrations which occurred during early farming times. More than ever before, the dog appears to have bound its destiny to that of humans at that period.

07 THE ARCHAEOGENETICS OF ESTONIAN SHEEP – WHAT DO WE KNOW SO FAR?

Author: Rannamäe, Eve - BioArch, Department of Archaeology, University of York, United Kingdom (Presenting author)
Co-Author: Pereira, Filipe - Interdisciplinary Centre of Marine and Environmental Research (CIIMAR), University of Porto, Portugal; Teasdale, Matthew - Smurfit Institute of Genetics, Trinity College Dublin, Ireland; Speller, Camilla - BioArch, Department of Archaeology, University of York, United Kingdom
Keywords: Ovis aries, aDNA
Presentation Preference: Oral

Sheep husbandry has been one of the most important cattle-based subsistence systems since the beginning of animal domestication. Sheep populations have been analysed worldwide using a range of modern genetic techniques, to which ancient samples can be compared. In Estonia, ancient sheep samples from the Late Bronze Age to the Modern Period (ca. 1200 BC – 20th century) have been studied using mitochondrial DNA (mtDNA) sequences. The analyses have shown that some of the maternal lineages extend back in time for almost 3000 years, with affinities to modern breeds, including the modern local Kihnu native sheep. Nevertheless, additional data is necessary to better place the ancient and modern Estonian sheep in a wider phylogeographical and temporal context. Here we present a detailed analysis of Estonian ancient mtDNA sequences with all available data retrieved from public databases. Moreover, we describe the results of the first whole genome sequencing of Estonian sheep ancient DNA using a high-throughput Next Generation Sequencing approach. Our results provide new insights into the history of Estonian sheep in archaeological and historical context.

08 THE CHICKEN COLONISATION OF EUROPE: DISPERSAL ROUTES, PATTERNS OF ADMIXTURE AND HUMAN SELECTION BASED ON ANCIENT AND MODERN GENETICS

Author: Dr Lebrasseur, Ophélie - Palaeo-BARN, Research Lab for Archaeology, University of Oxford; Department of Archaeology, University of Nottingham (Presenting author)
Co-Author: Dr Frantz, Laurent - School of Biological and Chemical Sciences, Queen Mary University of London; Palaeo-BARN, Research Lab for Archaeology, University of Oxford; Prof Larson, Greger - Palaeo-BARN, Research Lab for Archaeology, University of Oxford
Keywords: Chicken, Europe, DNA
Presentation Preference: Oral

Domestic chickens (Gallus gallus) have been important to the development of human societies, representing a significant food source and being used for religious and entertainment purposes. Originally native to Southeast Asia, chickens have been transported to Europe solely via human-mediated means but little is known of their timing and dispersal route. Furthermore, published studies have shown they interbred with other Gallus subspecies including Gallus sonneratii (the Grey Junglefowl) but such admixture is not believed to have been involved in the domestication process. This is particularly interesting since such an admixture led domestic chickens to possess yellow legs, a trait highly selected for in the last few hundred years.

Combing an extensive European archaeological chicken assemblage with Next Generation Sequencing, we seek to investigate the spatial and temporal introduction(s) of chickens in Europe and assess their admixture levels. Furthermore, we pay particular attention to the role of chickens at the time given its potential influence on selection by humans and consequently population pressures. Such questions are important to better understand today's genetic make-up of chickens and the implications for the future both in terms of the chickens' well-being and food security.

This research is part of the AHRC-funded project 'Cultural and Scientific Perceptions of Human-Chicken Interactions', and the presented genetic results will be combined with other lines of evidence from archaeology, anthropology, geography and other disciplines to provide a full picture of the natural and cultural history of chickens in Europe.

10 5000 YEARS OF DIETARY VARIATIONS OF PREHISTORIC FARMERS AT THE GREAT HUNGARIAN PLAIN

Author: Dr Gamarra, Beatriz - School of Archaeology, University College Dublin,Belfield, Dublin 4, Ireland; Earth Institute, University College Dublin,Belfield, Dublin 4, Ireland; Conway Institute, University College Dublin, Belfield, Dublin 4, Ireland (Presenting author)
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Keywords: isotopes, diet, Hungary
Presentation Preference: Poster

The development of farming catalysed the evolution of the human diet from the varied subsistence practices of hunter-gatherers to the globalised food economy we depend upon today. Although there has been significant research into the dietary changes associated with the initial spread of farming, less attention has been given to how diet continued to develop during subsequent millennia. In this study we used carbon and nitrogen stable isotope analysis to obtain dietary information on 48 individuals from the Great Hungarian Plain dating from the earliest Neolithic until the early Iron Age. We found evidence that early Neolithic individuals previously identified as having a genetic affinity to European Mesolithic hunter-gatherers, relied on wild resources to a greater extent than those whose genomes were typical for Neolithic farmers, and that the diet of these individuals varied on an inter-annual basis. We also identified millet consumption in the Late Bronze Age and Early Iron Age, despite its earlier arrival in the Great Hungarian Plain from Asia during the Neolithic.

11 DIETARY PATTERNS OF THE LAST HUNTERS AND FIRST FARMERS IN THE SE BALTIC, 4500-1500 CAL BC

Author: Dr Piličiauskas, Gytis - Lithuanian Institute of History (Presenting author)
Co-Author: PhD student Skipitytė, Raminta - Institute of Ecology, Nature Research Centre; Mass Spectrometry Laboratory, National Centre of Physical and Technological Sciences; Dr Koon, Hannah - Archaeological Sciences, University of Bradford; Dr Heron, Carl - Scientific Research, British Museum
Keywords: stable isotopes, pottery
Presentation Preference: Oral

Over the last several decades, analytical organic techniques (e.g. GC-MS and GC-C-IRMS) have been successfully applied to organic residues from ancient pottery in studies of function and food groups processed or stored inside pottery vessels. However, bulk δ13C and δ15N analysis (obtained by EA-IRMS) of charred deposits adhering to pottery vessel surfaces is less time consuming and much cheaper. Despite widely acknowledged shortcomings the method is highly valued because of hundreds or thousands of vessels may be studied and a long-term perspective on pottery use can be accessed. This presentation will summarise the results obtained by several hundred EA-IRMS measurements made on charred deposits from vessels dating from the Mesolithic to the Bronze Age found in SE Baltic, Lithuania. The results are discussed in relation to available archaeological, zooarchaeological, macrobotanical, bone collagen stable isotope and biomolecular data. Taken together the results highlight several local trajectories of dietary change in the SE Baltic over the period 4500-1500 cal BC. This overview of changing patterns of pottery use can then be tested further through targeted molecular and compound-specific analysis by GC-MS and GC-C-IRMS.

12 STABLE ISOTOPE ANALYSIS AND DIETARY IMPLICATIONS OF THE NEOLITHIC ABORA SETTLEMENT, SOUTH-EASTERN LATVIA

Author: Ms Legzdiņa, Dardega - University of Latvia, Institute of Latvian History (Presenting author)
Co-Author: Dr Zariņa, Gunita - University of Latvia, Institute of Latvian History; Dr Loze, Ilze Biruta - Latvian Academy of Sciences
Keywords: stable isotopes, palaeodiet
Presentation Preference: Oral

The Abora settlement is an inland Late Neolithic site, located at the Lake Lubāns wetland approximately 200 km from the Baltic Sea. The wetland, with 27 Mesolithic and Neolithic sites identified so far, is an important Stone Age inhabitation complex not only in Latvian, but also in North European context. So far, archaeological excavations have been conducted in 18 settlements.

Abora settlement, amongst others, is distinguishable by a few dozen burial finds within the inhabitation layers. With several excavation seasons during the 60s, 70s and in 2008, as well as the significant amount of published radiocarbon dates, the Abora settlement is one of the most researched sites in the wetland. However, stable isotope analysis approach was applied to this material only in 2016.

In this paper we present new carbon and nitrogen stable isotope analysis results from 14 Abora settlement burials, and discuss their implications for the Late Neolithic dietary practices. As a baseline for the human data, previously presented animal data from different Lake Lubāns wetland sites is used. The human isotope data from this period is of special interest for Latvian archaeology, as the Late Neolithic is considered to be the period when farming is established in this region.

419 EXPERIMENTAL HERITAGE: WORKING TOGETHER WITH TIME, ART AND HERITAGE IN THE LOCAL COMMUNITY

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Petersson, Bodil (Sweden) - Linnaeus University, Sweden
Co-Author(s): Mac Domhnaill, Brian (Ireland) - Cork Artists Collective, Cork, IrelandKvamme, Helle (Sweden) - Yellowbox, Sättra, Sweden; Cultural Think Tank Öland (Sweden)
Keywords: experimental heritage, art, archaeology, time
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

In 2015 Linnaeus University together with Cultural Think Tank Öland/Sweden initiated a collaboration project, Experimental Heritage, involving researchers, artists and the local community. The aim with this bottom-up session is to explore more general dimensions and meanings of heritage and artistic interpretation between past and present where both artists and archaeologists have their daily practice. The idea is to make archaeology and heritage relevant for he local community. Theoretical and methodical aspects as well as case studies related to this kind of interdisciplinary and cross-cultural collaboration between artists and archaeologists/heritage researchers and practitioners are discussed in this session. We wish to inspire others working with archaeology, heritage and art, connecting archaeology/heritage research and practice with artistic practices. We strive towards an anti-authoritative approach, pairing efforts of researchers, practitioners and artists alike for the benefit of the renewed uses and meanings of archaeology and heritage. The project aims at finding new interpretations and roles of the past in the present. We welcome presentations relating to connecting time, art and heritage in the local community.

01 INTRODUCTION TO EXPERIMENTAL HERITAGE – A NEW COLLABORATIVE METHOD FOR ARTISTS, ARCHAEOLOGISTS AND HERITAGE WORKERS

Author: Associate Professor Petersson, Bodil - Linnaeus University (Presenting author)
Keywords: art, archaeology, heritage
Presentation Preference: Oral

Experimental heritage is a developing working method used at the intersection of artistic interpretation and heritage work concerning both research and communication. The ambition is to create egalitarian meetings between artists, archaeologists and heritage workers within and outside academia and museums in the local society. The goal is to reload archaeology and heritage with new meanings in the present. Since January 2015 we have been working together, developing new approaches to art and archaeology/heritage in the local society. The project takes its departure in four themes relating to local archaeology and heritage. The perspectives are based in the landscape. The artistic interpretations mainly appear in landscape settings. The overall approach in the creation of artistic interpretation of archaeology and heritage is the use of sketch as method to approach the past and make it relevant today.

02 ARCHAEOLOGICAL PROCESS AND ART PRACTICE: A SYNTHESIS

Author: Archaeological Process and Art Practice: A Synthesis Domhnaill, Brian - Cork Artists Collective (Presenting author)
Keywords: trans-disciplinary, affect, absence
Presentation Preference: Oral

Brian Mac Domhnaill will give a presentation about his transition from archaeology to art and beyond into a more comfortable trans-disciplinary space in which there are fewer restrictions and more possibilities. His primarily archival and photographic practice follows investigative lines of enquiry to gain insight into a subject, drawing on pseudo-archaeological processes, abstract reasoning, experiential learning and collaborative interactions.

The perceived absence of a human subject in a physical space or location has often been the catalyst for further study and subsequent artistic responses. This led to an expanded enquiry into the interrelationship between anteriority (what has gone before in time), absence and affect, specifically its influence on his behaviour but also human behaviour in general. He examined this interrelationship in domestic and industrial contexts but also in the specialised and often marginalised environments associated with death and the body.

The choice of medium and means of display for each investigation serves to create a unique record whilst also provoking engagement with an open and incomplete archive. In deference to straightforward documentary narrative, he is interested in how this information and representation can be re-imagined within the context of the contemporary museum or gallery.

Brian will also give an account of his time spent on residency at the Yellowbox Art & Music Centre in Sweden where, through both solitary and collaborative research and fieldwork, he has been engaging with, reinterpreting and responding to the archaeological, natural and cultural landscapes of the island of Öland.

03 TRANSITION ZONE | BETWEEN HERITAGE, ART AND THE LOCAL COMMUNITY

Author: Dr. Clevis, Krien - TRANSITION ZONE (curator); www.overgangszone.nl
Co-Author: MA Schulze, Renan - TRANSITION ZONE (participant); re-collective; MFA Kersten, Eline - TRANSITION ZONE (participant); re-collective (Presenting author)
Keywords: Transition, Art/Heritage, Community
Presentation Preference: Oral

TRANSITION ZONE is a project about connections, participation and visibility, and involving heritage, art and research in the ENCI area. The entire area – as (geo)archaeological, landscape and industrial heritage –will transform into cultural heritage, natural landscape and wellness. This specific location, in which various experienced notions of place are making changes possible, is staffed by different parties. All these different stakeholders – ranging from the field of archaeological and paleontological research to local occupancy and tourism – provide their own perspective on the rearrangement of the ENCI-quarry. We invited 13 young artists, who work one-and-a-half year together with the stakeholders, in order to analyze and grasp the complexity of the ENCI area in the past and present towards the future. One could say that our way of conducting research is by co-creation. The project addresses the developments in the field of 'Experimental Heritage, involving researchers, artists and the local community'. We believe that in this complex, old location all these different parties can exist side by side, and tell their own story. In this paper we want to show what the effort of cross-cultural collaboration between artists and archae-

ologists/heritage researchers and practitioners can be, and how both artists/researchers and owners/users of a future heritage place can learn from each other. We propose to address the artistic methodology to the session-topic 'Experimental heritage...' We will do so by providing some examples of best practices in life form by the participants-duo Re-Collective. Simoulteneously, a series of artistic results will be presented in the ENCI quarry during the EAA-conference. Together, we aim to find out what the ENCI area in transformation with all the different notions of the place and during specific times can be. In this way 'transition zone' means also a meeting place for the local community and the artists.

04 AT THE INTERSTICES

Author: Researcher Jansson, Cecilia - Linnaeus University (Presenting author)
Keywords: Art Time Heritage
Presentation Preference: Oral

My project is about the time and process when human beings became settled. Through my artistic method, I want to gather and recompose knowledge about these people's life worlds, their experiences and attitudes towards the shifting aspects of life and different cultural ideas and expressions. Questions like "what characterizes the transition during this period in time?" and "what belonged, culturally, to the 'new' life and what traces remained of the old?" and "what impact does it have on me as an artist to establish a relation to the past?" have emerged in this process. In this sense, the project is about cultural history, but cultural history also provides a perspective from which different forms of cultural expression become interconnected, and this is mirrored in how my own work as an artist develops: in bridging different forms of artistic expression to create a new, comprehensive whole.

Prerequisites for my search for answers to the questions mentioned are (firstly) my artistic method and (secondly) the means of gaining access to the life worlds of past times that archeological excavations in places like Çatalhöyük, Göbekli Tepe and Ain Mallaha provide for me. It is about finding out the meaning of a place (and what it can hold in terms of memory and cultural sediments), and how a communication between then and now can be established and conveyed to others. The techniques I use in my artistic work are "modern", but the imagery and forms themselves are ancient.

05 BETWEEN TWO FORTS - ART PERFORMANCE

Author: Mrs Kvamme, Helle - yellowbox arts (Presenting author)
Keywords: art, performance, forts
Presentation Preference: Oral

The place chosen is an non-site. A before and an after. A place with anticipation, beside and between two forts. It is a forgotten forest that holds its own story, the untold. The importance of the forts the journey, the before and the after. There are straight lines, remains, fallen trees and empty barns. Seeking together, we walk the walk.

In a performance presentation a structure and a rhythm will be presented based on the search for an untold story. Fragments in a circular movement in the place in between.

Questions brought up in this presentation is how do we perform with a forgotten heritage, the places in between?

06 SKETCHING A SOUND MOUND FOR SANDBY BORG.

Author: Gill, Frances - Stuck in the Wood AB (Presenting author)
Keywords: sound Sandbyborg violence
Presentation Preference: Oral

I was curious as a musician and student of archaeology to see how a school of archaeoacoustics manifests itself in terms of thought. My impressions, evident in two prominent anthologies at the time, besides other associated literature revealed a prominent theme (and variations) concerned with Altered States of Consciousness (ASC). I argued from the relativist perspective that this is a trend indicative of an androcentric style of archaeological interpretation, that adopting ASC as a theoretical position through which to study the acoustics of sites and monument seems to speak more about an interest in ASC than in the sites and monuments, and questioned whether such a strong focus would have emerged if the field had been almost entirely dominated by women and/or other groups.
I will present another way to think and act regarding archaeological sites and music (subsuming sound and acoustics) through a demonstration of my project called 'SOUND-mound at Sandby borg'. I use a general concept of building a burial mound which hinges on the fact that dead people do not build mounds and that many bodies are required to make especially a large one. There are three aspects to the SOUNDmound. The first is the generation and collection of sound material from various community contexts. The second is making audio collages or sound sculptures from these materials. The third is placing the sculptures in the landscape to make a SOUNDmound accessed through a mobile phone app. The project aims to address a number of different contemporary world issues in tandem with contemporary archaeology, for example, sites associated with violence.

07 GREETINGS FROM ONE REFUGE CAMP TO ANOTHER OR TO PAINT WITH WIDE BRUSHES

Author: Artist Päivärinta, Johanna - Experimental Heritage; Sisters of Sättra (Presenting author)
Keywords: art, refuge, blanket
Presentation Preference: Oral

Art recipe: Choose an archaeological place like Ismanstorpsborg. Collect two thousand blankets in different colours. Place them in a pattern in the chosen place. Gather people to enjoy and collaborate with each other. Document with photographs and film. Send the blankets to a refuge camp in Syria.

08 CROSSING BOARDERS THROUGH EXPERIMENTAL ARCHAEO-ARTISTIC SKETCHING INBETWEEN FRAGMENT AND ENTIRETY

Author: PhD LJUNGAR-CHAPELON, Magali - Lund University; Linnaeus University (Presenting author)
Keywords: boarders, fragment, entirety
Presentation Preference: Oral

What happens when researchers in the fields of archaeology and artistic research together with artists strive to interpret cultural heritage in an experimental way by shaping sketches, installations, works of art and developing concepts, writing texts and poetry? As an artistic researcher with a background within performing arts and political sciences, my purpose in the Experimental Heritage project is to both theoretically and methodically and from a hermeneutical perspective highlight and discuss what kind of knowledge interdisciplinary collaborations at the borderland between artistic practice and scientific research whose common aim is to interpret cultural heritage may nurture. So long, half way within the project, after several workshops related to the archaeological sites of Sandbyborg, Ismantorps borg at Öland and the Blue Maiden Island (Southern Sweden), artistic and archaeological processes have been exposed and discussed with representatives of several disciplines such as design, interaction design, religion, history and enterprising. At this stage, a promising cross-disciplinary fora concerning the interpretative processes seems to emerge that will be further explored through interviews in depth with artists and archaeologists. This fora seems to be articulated through the question of crossing-boarders and setting limits, by apprehending one-other through artistic and scientific lenses that at times coincide and at times collide with each-other creating some kind of revealing distortion in the production of meaning. The related underlying question being that of the relationship between fragment and entirety and its meaning for the interpretation of cultural heritage as expressed through artistic and scientific sketching and shaping processes linked to ethical, ideological, academic, economic and politico-administrative power-related issues. In this contribution I will describe how contrasting, colliding or intertwined experimental sketching and shaping processes may look like so far within this archaeo-artistic fora.

09 TURNING TO OTHERS: ARCHAEOLOGY BEYOND TRADITIONAL MODES OF REPRESENTATION

Author: Ms Evangelou, Dora - Ephorate of Antiquities of West Attika, Piraeus and Islands- Greek Ministry of Culture and Sports (Presenting author)
Keywords: art, archaeology, interpretation
Presentation Preference: Oral

Archaeological research is nowadays continually extending its notions and focusing thoughts towards a multitude of topics. Yet, the purpose of archaeology as a practice in the present remains questionable.
How could archaeologist act as agents of interpretation, working with the material remains in order to construct alternative narratives of the past that meet present interests and values? The paper is concerned with the opportunities that archaeological sites and fragments provide us, as a mean to reconceptualise the past and foster the public to procure a meaning of the past that holds itself in the present. Rather than considering archaeological sites as monumental or heritage spaces, they can be embraced as spaces of multidimensional experience, creativity and cultural expression. Such an effort undoubtedly requires interdisciplinary borrowing and cooperation. This paper seek to explore the increasingly dynamic collaborations between artists and archaeologists that are developing over the last decade, as a way to overcome the gap between professional archaeologists and the public and poses the question of how archaeology can "meet" performing arts as an alternative way to read through the archaeological traces and perceive a deeper understanding of the past.
Three projects that took place in the city of Piraeus are presented and suggest that artists can bring in new images and narratives through their "language" and contribute to the recontextualisation of the archaeological fragments and the engagement of local community: "Unearthed", a dance performance that involves an archaeological site, a modern building and an archaeological exhibition, "The Urban Game", an interactive project that brings together digital art and performance at an archaeological site and the "Museum Theatre Project", where the archaeological remains and artifacts act as catalysts for creativity and research between archaeologists, anthropologists and actors running in parallel and in dialogue with one another.

10 THE REPRESENTATION OF THE ARCHAEOLOGICAL IN ART: THE CASE OF LATVIA.

Author: Mag.hist. Broka-Lace, Zenta - Institute of Latvian History, University of Latvia; Ģederts Eliass Jelgava History and Art Museum, Latvia; Faculty of History and Philosophy, University of Latvia (Presenting author)
Keywords: Archaeology, art, representation
Presentation Preference: Oral

When you have seen the movie before reading a book on which movie was based, it's almost impossible to not imagine characters as the actors you have already seen. Sometimes it feels disappointing to see that the character you have read about and imagined perfectly has not the slightest resemblance with the actor chosen for the movie. Similar feelings emerge in relation to art and archaeology.
Art definitely is an important part of archaeology. At first, despite all the opportunities provided by the digital age, we still use drawers' talents to record information directly on field. Furthermore, artist is the one that helps to reconstruct buildings, clothing and faces from the small fragments that archaeologists have found. It is hard to imagine archaeologists' work without close collaboration with artists.
Nevertheless artists themselves have their own views on past. It seems that artists, inspired by romanticism, were the first ones to appreciate hillforts and castle ruins as an influential part of landscape even before archaeology became a science. For example – one of the first known archaeologists in (the historical territory of) Latvia – Julius Döring (1818-1898) primarily was an artist.
Along with that in art history of Latvia we see many examples where artists have illustrated the prehistorical times way too freely. What happens when artists' imagination has gone too far? Which image has more influence in general public? What's right and what's wrong? Where between art and science lies the truth?
The aim of this paper is to examine how art and archaeology historically have developed, coexisted and influenced one another in Latvia. Above all it is an attempt to understand how our past actually looks and how we would prefer to see it.

11 IN DIALOGUE WITH A SPRING, ARTISTICALLY EXPRESS ITS UNIQUINESS FROM PREHISTORIC TIMES AND THE PAST TO THE PRESENT AND FUTURE.

Author: Art and craft teatcher/artist Andersson, Anita - Linneus University (Presenting author)
Keywords: spring, heritige, art
Presentation Preference: Oral

The purpose of this work is to highlight and make visible a spring, its spring water and environment. The study and its results would be helpful for people to create a relationship and interest in springs. The idea is that the spring, its spring water and environment must become a place of knowledge and research in various fields, recreation and creative various aesthetic expressions.

This study examines a spring, the spring water and the environment from the artistic perspective through artistic processes based on the sketch as a method. As the author / artist has an ethos rooted in sustainability, the dialogue with the source have been of the greatest importance. Theoretical background information collected by the representatives of the spring who have knowledge of the spring, nature and environment, such as biologists, geologists, environmentalists, local history society, landowners, government institutions and municipal activities and more. From a recreational perspective, meditation and yoga have been practiced in the springs environment. Artistically are dance and stories expressed. In this study the spring meet prehistoric and the past with the present and the future.

12 CREATING ROOM FOR PLAY AND LEARNING WHILE REACHING OUT TO A YOUNGER AUDIENCE AT CULTURAL HERITAGES

Author: Interaction Designer Salo, Johan - Do-Fi (Presenting author)
Keywords: Interactivity, Play, Learning
Presentation Preference: Oral

In 2016, 81% of all Swedes access to smart phones (source: iis.se)
Pokemon Go exploded in the summer of 2016. In Sweden, municipalities and school encouraged kids to explore the sites suggested by the game. But Pokemon GO offered only gaming but not so much learning linked to the site.
Since 2006 I have been involved in projects concerning learning and location-based services encouraging outdoor exploring. The problems in the earlier projects was often that no one had the technology. Now the problem seems to be the lack of content and narrative.
How can practitioners involve and invite the local community to be engaged in game, play and learning about the cultural heritage both outdoors and indoors?
How can practitioners combine archeology, arts and culture to design a meaningful experience in the digital sphere?
As an interaction designer I propose a new approach on how to engage and reach out to a broader and younger audience in mind.

13 COMMUNITY MANAGEMENT IN THE UNESCO WORLD HERITAGE PREHISTORIC PILE DWELLINGS AROUND THE ALPS IN AUSTRIA

Author: Magistra Loew, Carmen - Kuratorium Pfahlbauten
Co-Author: Magister Artium Dworsky, Cyril - Kuratorium Pfahlbauten (Presenting author)
Keywords: community management, communication
Presentation Preference: Oral

The World Heritage Convention requests state parties to protect their World Heritage sites, and make them accessible to public. The Kuratorium Pfahlbauten has been entrusted with the national management of the UNESCO World Heritage Prehistoric Pile Dwellings around the Alps in Austria. In the day-to-day work it soon became clear that a pure scientific approach from an archaeological perspective could not be enough in administrating and maintaining these underwater sites. It is also not sufficient to include tourism perspectives and needs. Equal involvement of the population has been a management goal from the very beginning. The variety of the functions and chances of archaeological sites became particularly apparent in a research project "Doing World Heritage - Comprehending World Heritage".
The important role of the public is also based on the awareness that heritage protection cannot be implemented by laws alone. For the preservation of heritage, it is essential that the need for protection is not only met with acceptance by the local population but is also actively supported. In order to establish a social control, the Kuratorium strategically develops its relations with the population and strives to make them sustainable. This community management approach is also suitable to fulfill the demand for public participation, which can be derived from the World Heritage Convention.
A heritage can only have an effect if it is present in everyday life. Therefore the Kuratorium is looking for the most comprehensive communication possible. To do so, it is also bound by a position paper of the Austrian World Heritage Sites. But the integration in everyday life also takes place by taking in impulses from locals. In these, the World Heritage management occupies a mediation role.
The lecture discusses the challenges and opportunities of an appreciative involvement using the example of the pile dwelling world heritage.

420 TELLING WORLD HERITAGE STORIES: COMMUNICATING ARCHAEOLOGY TO LOCAL COMMUNITIES AND TOURISTS AT EUROPEAN WORLD HERITAGE SITES

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Acheson, Coralie (United Kingdom) - University of Birmingham
Co-Author(s): Castillo Mena, Alicia (Spain) - Universidad Complutense de MadridLöw, Carmen (Austria) - Kuratorium Pfahlbauten - UNESCO World Heritage "Prehistoric Pile Dwellings around the Alps" in Austria
Keywords: Archaeological interpretation, World Heritage, Tourism
Presentation Preference: Session with pre-circulated papers

This session intends to explore and evaluate the role of archaeology in touristic experiences of World Heritage in Europe. In heritage management there are two important target groups we address: the local communities and tourists. Both seem to have different interests and different needs. But are they really different and how and why do we address them?

From this theoretical position, but also a practical sense of the realities of cultural heritage management, we are looking for experiences that help us to redefine the role of archaeology in the touristic narratives of World Heritage Sites. Topics include:
- The communication of archaeology in the context of tourist experience;
- Local quotidian and contemporary values within tourist experience of World Heritage, and the compatibility of these to the need to promote the sites' Outstanding Universal Values;
- New tools for communicating archaeological values at World Heritage Sites: official and lay narratives within social media and other forms of digital engagement;
- Interacting with archaeological values on sites where archaeology is not integral to the inscription on the World Heritage List (i.e. sites inscribed for artistic, ethnographic, monumental or other values)
- Conservation vs visitors: how can we reimagine and communicate the discourse of preventative conservation in the context of mass tourism?

This session is proposed in the context of working party of Tourism and Archaeology, in connection with the Menorca's conferences of Best Practices in World Heritage and with the UNESCO World Heritage "Prehistoric Pile Dwellings around the Alps".

01 TOURISM 3.0 AND ARCHAEOLOGY

Author: Corpas, Nekbet - universidad complutense de madrid (Presenting author)
Co-Author: Castillo, Alicia - Universidad Complutense de Madrid
Keywords: tourism, archaeology,UNESCO
Presentation Preference: Oral

This paper aims to deal with participatory approaches in different World Heritage contexts. Archaeology is not the main focus of the local government's strategy for tourism but, is there alternative ways of engaging with it? New touristic platforms such as trip advisor or trazers are reverting traditional touristic unidirectional discourses from governmental bodies to audiences. Through this sort of products, tourists produce themselves contents (e.g. photographs, facts, experiences...) which are publicly shared. Is this sort of collaborative platforms widening the gap between archaeological and tourist discourses? What can these collaborative platforms tell us about archaeological data in economic spheres? Drawing on discourse analysis and ethnographic work, we will explore these issues.

02 THE BIRTHPLACE OF INDUSTRY: TELLING WORLD HERITAGE STORIES IN THE IRONBRIDGE GORGE

Author: Raine, Joe - Ironbridge International Institute for Cultural Heritage (Presenting author)
Co-Author: Acheson, Coralie - Ironbridge International Institute for Cultural Heritage
Keywords: world heritage, interpretation
Presentation Preference: Oral

The Ironbridge Gorge's claim to being the birthplace of industry originates, not from the titular bridge, but instead from a now unassuming structure a short distance away in Coalbrookdale which played a vital part in kick-starting the Industrial Revolution. If the Ironbridge Gorge World Heritage Site is, as it regularly claims, 'as important as the pyramids,' then the Darby Furnace is the Sphinx to the Iron Bridge's Great Pyramid. Two iconic industrial heritage sites vital not just for their role in the history of the Industrial Revolution but also for the acceptance of industrial monuments as part of the World Heritage List.

The Darby Furnace has no shortage of stories to tell, it is a global symbol of innovation, a place of work for generations of people, the birthplace of modern industry and one of the first Industrial World Heritage Sites to spotlight a just handful. The challenge remains though; how to communicate to a range of audiences the significance of structure that has been described in the same line both as 'a pile of wet bricks' and 'a shrine to the industrial age'?

This paper will aim to explore both the particular challenges of interpreting industrial archaeology to a wide range of audiences and how Ironbridge's World Heritage Status impacts on how the story of the Darby Furnace is told.

03 TOURIST EXPERIENCE OF EPHESUS: A MULTI-LAYERED CULTURAL LANDSCAPE OR AN ANCIENT ROMAN CITY?

Author: Assist. Prof. Dr. Akture, Zeynep - Izmir Institute of Technology (Presenting author)
Keywords: Ephesus, tourist ritual
Presentation Preference: Oral

"Ephesus" was inscribed in the UNESCO World Heritage List in 2015 as a serial property of four components documenting settlement continuity in a continuously evolving cultural landscape: the prehistoric Çukuriçi Mound; the Ancient City of Ephesus; the Ayasuluk Hill, Artemision and Medieval Settlement with the Basilica of St. John and Isa Bey Mosque; and the House of Virgin Mary. All are open for visitors except Çukuriçi Mound, though the Ancient City receives the greatest number, mostly from cruisers visiting Kuşadası and Izmir harbours. Rivalling agencies schedule at most two hours for a guided tour starting from the upper entrance of the site, continuing along the main street of the ancient city with restored Roman period monuments, and ending at the lower entrance. The Artemision is usually visited before St John's Basilica, Isa Bey Mosque, and Efes Museum.

In this paper, I compare this modern tourist "procession" with an early 2nd century AD one whose details were inscribed on a wall of the Theatre of Ephesus. The inscription is in The British Museum since John Turtle Wood had discovered the Artemision following the route described in it, thus starting museumification of Ephesus. Analysis of the Roman period procession in terms of "ritualized behaviour" in the sense proposed by Pierre Liénard and Pascal Boyer facilitates scrutinizing modern visitor experience of Ephesus as "ritual space", following Carol Duncan's criticism of the modern museum for imposing the same architectural scenario to all visitors as if participating in a "sacred ritual" . The cumulative image out of a tour visit to Ephesus is one of a Roman city instead of a multi-layered settlement that owes its Outstanding Universal Value to this aspect. This exemplifies effects of museological choices on popular images held of archaeological sites, emblematised for Ephesus by that of the Library of Celsus.

04 BRÚ NA BÓINNE, CO. MEATH, IRELAND: PROBLEMS, POTENTIAL AND PROGRESS IN THE PRESENTATION OF THE BEND IN THE BOYNE WHS

Author: Dr Davis, Stephen - University College Dublin (Presenting author)
Co-Author: Dr Ní Lionáin, Clíodhna - Devenish
Keywords: Ireland, community, tourism
Presentation Preference: Oral

The Archaeological Ensemble of the Bend in the Boyne, also known as Brú an Bóinne, is one of only two WHS in Ireland and represents one of Europe's most significant prehistoric landscapes. It is also one of only three WHS to have invested in a dedicated Research Framework and represents a key tourist attraction within the Irish offering, a jewel in the crown of 'Ireland's Ancient East'. However, community engagement in Brú na Bóinne has historically offered a significant challenge, with perceptions of the World Heritage designation sometimes being less than favourable. This paper will outline and discuss these issues, and specifically consider how we might move away from communicating Brú na Bóinne for a tourist audience and provide it with both relevance and currency within a living, agricultural landscape.

05 TOURISTIC USE OF THE UNESCO WORLD HERITAGE "PREHISTORIC PILE DWELLINGS AROUND THE ALPS" IN AUSTRIA

Author: Magister Dworsky, Cyril - Kuratorium Pfahlbauten
Co-Author: Magistra Loew, Carmen - Kuratorium Pfahlbauten (Presenting author)
Keywords: mediation underwater tourism
Presentation Preference: Oral

Since 2011, 111 pile dwelling sites are united in the international UNESCO World Heritage "Prehistoric Pile Dwellings around the Alps". From the beginning the Kuratorium Pfahlbauten, which is entrusted with the management of the Austrian part of this World Heritage, was addressed with wishes for a touristic use. Since all pile dwelling sites in Austria are underwater sites, this is not easily possible.

In 2013, the Kuratorium has erected three information pavilions in Upper Austria in collaboration with local associations and municipalities. The themes of all three pavilions correlate to each other. Nevertheless, all three also provide basic information about the world heritage. They are used by local associations as well as by the Kuratorium for mediation programs.

Different to the situation in Upper Austria the pile dwelling site in the Keutschacher See in Carinthia is so far not yet visible to the public. An architects' competition initiated by the municipality and co-ordinated with the Kuratorium will soon change this. It will be the task of the Kuratorium now to prepare the topic "pile dwellings" for outreach programs.

In addition to these measures taken on land, possibilities to approach the topic under water in the Attersee in Upper Austria have been in the focus since 2016. This lake is a well known diving destination, so it is obvious to create a Pile dwelling related offer for scuba divers under water. The concepts led to underwater attractions that are interesting diving spots as well as they enable sports divers to familiarize themselves with the topic of "pile dwellings". The intention within is also to raise awareness at these most important stakeholders under water for the needs of the heritage protection.

The lecture presents the thoughts underlying the conceptions and addresses the challenges and opportunities of working with tourist-focused stakeholders and tourists.

06 NOTHING BUT FLOWERS? ENGAGING WITH THE ARCHAEOLOGY OF THE COLONIES OF BENEVOLENCTE THROUGH NON-DESTRUCTIVE GEOPHYSICAL SURVEYS

Author: Coolen, Joris - Zentrum für baltische und skandinavische Archäologie, Schleswig (Presenting author)
Keywords: geophysics, public archaeology
Presentation Preference: Oral

In 2017 the Dutch and Belgian governments nominated the Colonies of Benevolence for the UNESCO's World Heritage List. The nominated heritage consists of seven colonies in the northern part of the Netherlands and Flanders that were founded in the 19th century to host poor families, orphans, beggars and vagrants. All seven colonies were marked by a strictly planned landscape and uniform architecture, large parts of which still survive today.

Although the nominated heritage includes some areas of archaeological value, the Colonies of Benevolence are not generally perceived as archaeological heritage. As most of the colonies present a seemingly well-preserved ensemble and are historically well documented, the added value of archaeology is neither obvious to the public nor to local residents and politicians.

A small research project in Veenhuizen (province of Drenthe, the Netherlands) aims to enhance the awareness of the archaeological value of the Colonies by a non-invasive geophysical survey. The project focuses on one of the large orphanages that was built in Veenhuizen by the Society of Benevolence in the 1820s and demolished around 1925. Local residents are encouraged to volunteer in the survey work. A successful music theatre play that is staged in the Dutch national Prison Museum in Veenhuizen offers an opportunity to communicate the project to a large audience. A local initiative has made the outline of the building visible by a flower bed in the meadow.

07 WHAT CAN WE DO FOR THE TOURIST? ENGAGEMENT OF LOCAL COMMUNITIES IN ARCHAEOLOGICAL TOURISM SCHEMES. AN EXAMPLE FOR WORLD HERITAGE.

Author: Ms. Dunning, Ellinor - ArchaeoConcept
Co-Author: Dr. Dunning Thierstein, Cynthia - ArchaeoConcept (Presenting author)
Keywords: community engagement, tourism
Presentation Preference: Oral

Community-centred actions are a main concern in the management of WH properties. But most examples of successful projects are outside of the WH. Thus the project "Site-of-the-month.ch" allowed us to understand the importance of the implication of the local communities in the development of a regional touristic product with national and international impact. The actors are members of associations, taking over responsibilities usually assigned to the regional or national archaeological authorities. Amongst these,

we can consider conservation, development of activities and transmission of knowledge which all lead to a sense of belonging to a special place, which can be communicated to visitors from around the world. They are the perfect partners providing a fundamental link between the state organisations and the local population particularly in relation to tourism requirements.

423 SCULPTURED STONES AS TRANSGRESSIVE OBJECTS: CARVING LIMINALITY IN EARLY MEDIEVAL NORTH-WESTERN EUROPE

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Busset, Anouk (Switzerland) - Université de Lausanne; University of Glasgow
Co-Author(s): Maldonado, Adrián (United Kingdom) - University of Glasgow
Keywords: sculptured stones northwestern Europe Christianity
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

MERC
Medieval Europe Research Community

This session will discuss the role of early medieval carved stones as embodiments of liminality in north-western Europe (British Isles and Scandinavia). Carved stones are strongly associated with territorial boundaries, bridges, or entrances. But beyond demarcating the limit of a religious or secular estate or the passage between lay and consecrated ground, they can also be nodal places in their own right, where the mundane meets the supernatural, habitation meets wilderness, or the living meet the dead. We can go further and argue that sculptured stones can be seen as transgressive by their very nature, between natural rock and shaped stone. In many cases, the stone is itself consecrated, especially when marked by the sign of the cross, becoming neither natural nor handmade, but imbued with the supernatural. Stones can be skeumorphic, representing other materials such as wood and metal which play with or even reject the materiality of the physical object. This transitional essence may also be contained in the imagery or inscriptions carved or incised on the stone, as representations of distant places, ancient myths or names of the absent dead, embodying distant places, people and times. In this sense, carved stones can be seen as transgressive of place, time and substance. We invite papers which challenge a functionalist perspective on carved stones in early medieval north-western Europe and pose new questions on the lived experience of sculpture.

01 CROSSING A LANDSCAPE: MEDIEVAL CROSSES AS A MEANS OF MOVEMENT

Author: Mr Johnson, Andrew - Manx National Heritage (Presenting author)
Keywords: grave-markers, monuments, movement
Presentation Preference: Oral

The Isle of Man is a small island just 580 square kilometres in area. It has a rich early Christian heritage, manifest in 170 medieval chapels and burial grounds and over two hundred medieval carved stone crosses and inscribed stones.

The crosses range from small, simple grave-markers to intricately carved memorials of monumental scale; a few meanwhile served an architectural role within some of the chapels. Some are utterly anonymous, whilst others bear inscriptions which represent the island's only documentary sources for a period extending from the 6th to 11th centuries.

The majority are now displayed at parish churches distributed around the island, and have become objects of modern pilgrimage to local communities and visiting academics alike. Is there anything to be learned from this veneration about how the crosses might have been used and viewed by those who made them?

In almost all cases, the findspots of the crosses are known. As part of ongoing research on the medieval chapels and burial grounds spread through the island, the various types of cross have been analysed and correlated with their location, with interesting results.

Whilst the small slabs incised with simple crosses were probably used to mark individual graves and would have held little significance beyond family members, it is becoming apparent that other, more intricately carved crosses could have played a significant role as cult objects attracting the interest of local communities and perhaps of pilgrims drawn from further afield.

As a consequence it may also be possible to suggest how the landscape of the island, in places intensively farmed, in others rugged and difficult, could have been traversed at a local level and over longer distances by those going to church, to the graveyard, or seeking greater faith.

02 EARLY CHRISTIAN LANDSCAPES IN MOTION: THE TRANSFORMATIVE ESSENCE OF CARVED STONES

Author: Busset, Anouk - University of Glasgow / Université de Lausanne (Presenting author)
Keywords: Stones movement landscape
Presentation Preference: Oral

Within the Christianisation process, carved stones are enfolded as a prominent part in the process, by embodying and expressing Christianity as part of identities chosen by elites, and to convey a message of power in the landscape. These monuments are used within memorial practices, and to embody the sacred for the people through the landscapes they experienced, inhabited, traversed, and assembled throughout their lives. This presentation will focus on the theme of movement and examine how stone monuments create nodal points in liturgical landscapes during the early medieval period. Through a case study focusing on the carved monuments of Glen Lyon in Scotland, a comparative analysis will be offered, bringing together examples from Ireland and Sweden, which will centre on the transformative essence of carved stones, through their inscriptions and imagery, as well as their situation in the geographical landscape. Carved stones located alongside pilgrimage or liturgical paths participate in the creation of sacred movement, delineating devotional paths, while embodying and concentrating the transformative essence experienced by their audience. Movement itself is an integral part of this transformational experience. While carved or inscribed stones provided points to delineate the wider journey, they also formed nodal points throughout the sacred paths to focalise devotional practices.

03 'LIMINALITY AND TRANSGRESSION ON TWO INSULAR CARVED STONE MONUMENTS – THE GOLSPIE SYMBOL-BEARING CROSS-SLAB AND THE DOWNPATRICK HIGH CROSS'

Author: Mr King, Michael - Down County Museum (Presenting author)
Keywords: cross, liminality, salvation
Presentation Preference: Oral

The aim of this paper is to compare and contrast two Insular carved stone monuments, the late 8th/early 9th century symbol-bearing cross-slab from Golspie, Sutherland and the late 9th/early 10th century Downpatrick High Cross, now on display in Down County Museum, and to consider them as embodiments of liminality. Research by the author on the Downpatrick High Cross has shown that it was located outside the entrance to the outer enclosure of the monastery of Dun Lethglaise, with its outward east-facing side displaying figures carved in relief which encapsulate the biblical history of salvation from Adam and Eve to the Last Judgement. The occurrence of Christ entering Jerusalem in the centre of the shaft will be considered in relation to the liminal location of the high cross itself, reflecting the symbolism of Christ redeeming the faithful and leading them into the heavenly Jerusalem, and inviting the viewer to enter the symbolic Jerusalem of Ireland, where in the inner rath of Dun Lethglaise, the reputed burial-place of St Patrick was venerated by pilgrims from the early medieval period. A 17th-century text describes a coffin being carried around the high cross before burial in the parish church, suggesting an earlier ritual in which the cross was also in a sense a 'key' that could be turned to assist the dead to enter the gates of Heaven. Just as themes of liminality are found on the side opposite the Crucifixion on the High Cross, so a transgressive figure is displayed on the side opposite the relief cross on the Golspie symbol-bearing cross-slab, now in Dunrobin Castle Museum. My paper will suggest an identification of the transgressive figure, striding forward brandishing axe and knife, and attempt to elucidate the meaning of the symbolic imagery, similarly designed to provoke the viewer into positive action.

04 CARVING AND IMAGINING SACRED SPACE IN EARLY MEDIEVAL INSULAR SCULPTURE

Author: Dr Stoner, Heidi - University of York (Presenting author)
Keywords: Iconography, Insular, Sculpture
Presentation Preference: Oral

The iconographic programmes of Early Medieval Insular stone monuments present sacred space in various ways and the inclusion of Christological iconography in turn sacralises the early ecclesiastical foundations where these monuments are found, the iconographies placing the monuments in a juxtaposition between temporal and spatial realities. This paper will examine the presentation of Christological imagery around the Irish sea zone in order to discuss the ways in which sacred space is carved and imagined. The depiction of sacred space within the iconographies of stone sculpture adds to the ability of early medieval carved stones to embody liminal space. By seeing the carved panel as essentially spatial, while also representing the figural through abstraction this paper will argue that the methods of viewing these monuments present a physical access point between the physical and metaphysical worlds, presenting a boundary between the natural and supernal; as well as, the earthly and the heavenly spaces represented. This transgression of time and space can be understood through the act of carving and erecting these monuments, but it will be argued, can only be understood through a thorough examination of the eschatological iconographies that they present.

05 ENGRAVING AS EPITAPH? COMMUNING WITH THE DEAD AT THE SCULPTOR'S CAVE, NE SCOTLAND

Author: Doctor/Phd Buster, Lindsey - University of Bradford (Presenting author)
Co-Author: Professor Armit, Ian - University of Bradford
Keywords: Pictish, cave, liminality
Presentation Preference: Oral

Much ink has been spilled on the Pictish symbols of NE Scotland, yet most discussions draw on the corpus of free-standing cross-slabs, with less attention paid to the smaller number of carvings which occur in natural places, such as caves. The Sculptor's Cave in NE Scotland is one such place. For more than a millennium it was perhaps the ultimate in liminal locations– set between land and sea, between this world and the next, and thus an ideal location for that most liminal of human transformations; from fleshed bodies to the disarticulated bones of ancestors. The symbolism of the place, established in the Late Bronze Age, cannot have been lost on those who, in the late Roman period, marched a group of at least six individuals down to the cave where they met their fate by decapitation. The Pictish symbols, carved some time later around the cave's entrance passages, thus represent the final act in a long sequence of physical manifestations of liminality associated with this special place. What the symbols mean we cannot know. Were they the epitaphs for those executed individuals, their story told and retold as legend? Or did the carvers of the symbols simply wish to commune with the ancestors, as others had before them ¬– the picking and re-picking of motifs opening up and maintaining that portal between this world and the next. Or perhaps they were a warning for others – the symbolic closing of a pagan place in a newly Christianised society.

06 WHEN IS A STONE NOT A STONE? EARLY CHRISTIAN CROSS-MARKED STONES AS SUBSTANTIAL TRANSFORMATION IN NORTHERN BRITAIN

Author: Dr Maldonado, Adrian - University of Glasgow (Presenting author)
Keywords: cross, cosmology, materiality
Presentation Preference: Oral

The early medieval period in northern Britain is characterised by the production of several kinds of Christian stone sculpture, forming regional 'schools' or styles. Underlying these regional divisions is a rich seam of simple cross-marked stones which are widespread and difficult to date. Each of these is an intervention upon locally-gathered materials that involved selection, transport and negotiation of the specific materiality of the stone using available technology. It reframed the living rock, giving it a face (or several faces), a head and foot end. This did not kill it or render it artificial as in less than natural - rather it imbued it with the supernatural, as making the sign of the cross was a blessing of the stone. The cross symbol is a citation of a wooden object made sacred matter through the sacrifice of Christ, and its rendering in stone can be seen as an allegory of substantial transformation from sinful earthly body to heavenly soul. The form of the cross is thus less important than the transcendence it effected. The simple cross-marked stone can be seen as one of the more evocative ways in which Christian cosmologies emerged through, and were not just imposed upon, existing landscapes.

424 HOLOCAUST ARCHAEOLOGIES: TRANSDISCIPLINARY APPROACHES, ETHICAL ISSUES AND USES OF THE PAST

Theme: 3. Trans- and Metadisciplinary Approaches in Archaeology
Author: Sturdy Colls, Caroline (United Kingdom) - Staffordshire University
Co-Author(s): Van der Laarse, Rob (Netherlands) - University of Amsterdam
Keywords: Holocaust, ethics, competing memories
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Over the last decade, the number of archaeological projects at Holocaust sites has increased significantly, resulting in surveys and excavations at camps and killing sites across Europe. However, it is only in the last few years that this field of study has been more widely recognised as valid, useful and appropriate. How can this transition be explained? What role have survivors, their relatives and the public played in the development of archaeological projects of this kind? What have archaeologists contributed to our understanding of this traumatic European heritage? In what ways do archaeologists become "citizen scientists", speaking for the dead and revealing forgotten narratives relating to people who cannot speak for themselves? Because of the immense impact of these crimes, archaeological approaches may be shaped by ethical demands, religious sensitivities and politics. Once projects are completed, at local, national and international level, archaeological findings from Holocaust sites may be used by others to rewrite historical narratives, develop political rhetoric, valorize spaces and objects, or even deny the crimes ever took place. How can archaeologists account for these uses of the past?

This session will feature papers from a trans-disciplinary and transnational team working on uncovering the forgotten narratives pertaining to the Holocaust. It will also invite other researchers who have contributed to archaeological investigations from a variety of fields to share their experiences and discuss the issues raised above. Contributions centred on collaborations between archaeologists, religious authorities, community groups, artists and other experts outside of archaeology are particularly welcome.

01 ESCAPE FROM PONAR (PANERIAI) - ARCHAEOLOGY, GEOPHYSICS AND TESTIMONY

Author: Dr. Seligman, Jon - Israel Antiquities Authority (Presenting author)
Co-Author: Prof. Freund, Richard - University of Hartford; Prof. Jol, Harry - University of Wisconsin-Eau Claire; Prof. Reeder, Philip - Duquesne University; Mr. Bauman, Paul - Advisian; Dr. McClymont, Alastair - Worley Parsons Canada
Keywords: Ponar, Geophysics, Testimony
Presentation Preference: Oral

The extermination site of Ponar (Paneriai) near Vilna (Vilnius), was the largest Nazi mass-murder site in Lithuania, being the resting place for some 100,000 victims, 70,000 of whom were Jewish residents of Vilna and the surrounding area.

In 1943, Nazi units, on order through Sonderaktion 1005, began to to cover up the crime at Ponar. Eighty inmates, drawn from Jewish prisoners captured in Vilna after the liquidation of the Ghetto and suspected Jewish POWs from the Stutthof camp, were formed into a Leichenkommando. Anticipating their fate after the completion of their task to exhume and burn the victims' remains, the prisoners dug a tunnel from their prison bunker to an adjacent pit. On the evening of the 15th April 1944 the escape bid was made. Only eleven of the group managed to make their way to the partisans and survive the war.

In the summer of 2016, on the invitation of the Vilna Gaon Jewish State Museum, our team was invited to conduct a geophysical survey to retrace the path of the escape tunnel. Using Electrical Resistivity Tomography we managed to clearly identify the line of the tunnel, from which curatorial decisions for the presentation of the site can be made.

Of no less interest was the appearance of descendants of the eleven after the press announcement of the project. Contact made with the families made a scientific project into a human story, especially with the addition of private testimonies that provide minute detail of the construction of the tunnel to augment the physical data.

The paper will describe the background, the geophysical discoveries and the integration of testimony into the project at Ponar. The dilemmas facing the team, especially the use of first hand evidence and the problems of future stewardship will also be addressed.

02 ON THE EVE OF THE ROMA HOLOCAUST: „ZIGEUNERLAGER" IN LETY (CZECH REPUBLIC)

Author: Dr Plzak, Jindrich - University of West Bohemia (Presenting author)
Co-Author: Dr Varekova, Zdenka - University of West Bohemia; Ass. Prof. Vareka, Pavel - University of West Bohemia (Presenting author); Dr Krivanek, Roman - Institute of Archaeology, Czech Academy of Sciences (Presenting author)
Keywords: Roma, campscape, conflict-archaeology
Presentation Preference: Oral

„Protektorat Böhmen und Mähren, part of Czechoslovakia occupied by Hitler´s Germany, was included in the Nazi plans for Extermination of Roma in Europe. In August 1942 two concentration camps were established in Lety (Bohemia) and Hodonín (Moravia), where Roma from the Protectorate had been assembled before they were transported to Auschwitz and Birkenau. A total of 1309 prisoners passed the Lety camp in Bohemia (distr. of Písek) and at least 326 of them died there mostly of starvation and diseases. Recent research aimed to locate the Roma camp and cemetery of victims in Lety and identify their remains using non-invasive methods. Documentary evidence and historical aerial photographs´ analysis, aerial scanning, geophysical and topographic survey produced an evidence of both camp traces and graves. The camp is currently covered by a pig-farm built in 1970s, however, the survey has demonstrated that ca. 90% of the camp is preserved as archaeological site represented by the barracks´ and other buildings´ foundations, ditches and debris of some kind. The survey of a supposed camp cemetery revealed a strong evidence of graves of different size providing first exact information about burial place of victims and its structure. Presented research have brought significant material evidence which will be included in heated debate regarding shameful situation in Lety and often neglected "Porajmos", the Roma Holocaust.

03 PREDICTING OUR VIOLENT PAST. MATERIALITY OF HOLOCAUSTS, GENOCIDES AND MASS-OPPRESSIONS IN EUROPE.

Author: Prof. Dr Jasinski, Marek E. - NTNU Norwegian University of Science and Technology, Department of Historical Studies (Presenting author)
Keywords: Materiality, Holocausts, Theory
Presentation Preference: Oral

Archaeological research on Holocaust and other recent genocides has been during last decades gaining a very significant role in European studies of such cultural phenomena as extermination, exclusion, and other forms of oppressions based on ethnicity, religion, gender, social identity and other factors.

At present there exists two main ways of understanding materiality. The older one perceives materiality simply as product of human culture with the strong dichotomy between Subject and Object and looks upon artefacts and material structures from the past simply as leftovers. In this perspective, the archaeological record (objects, structures and cultural landscapes) after ending its functional existence becomes a passive carrier of incomplete information about the past. The more recent way of perceiving and understanding Materiality is based on the view that materiality is not simply a product of cultural worlds, but its integral and entangled part constituting a dimension without which any cultural phenomenon cannot occur. The new key-theories of materiality developed in anthropology and other social sciences in the 1980s demonstrated that social worlds were as much constituted by materiality as the other way around. Social worlds create materiality which in turn influences social worlds to the highest degree. Materiality is omnipresent in social words and social worlds cannot exist without material dimensions. Materiality is not a product of culture but its subject. Culture is an endless combination of hybrid forms of coexistence of humans and materiality.

This presentation describes and discusses theoretical approaches towards Materiality of such extremely liminal `spaces of exception` as camps/cultural landscapes of Holocaust, other genocides and mass oppressions. Materiality plays several very specific roles in places where the ever present risk of death and strategies for survival constituted an everyday life framework for prisoners. Material evidence from such sites is crucial for ethics and uses of the violent past.

04 LAST WITNESSES: ARCHAEOLOGICAL FINDS FROM THE NAZI EUTHANASIA INSTITUTION OF HARTHEIM AS OBJECTS OF RESEARCH, EXHIBITION AND EDUCATION

Author: Mag. Schwanninger, Florian - Lern- und Gedenkort Schloss Hartheim (Presenting author)
Keywords: NS-euthanasia, Hartheim, finds
Presentation Preference: Oral

In the Renaissance Castle of Hartheim, more than 30,000 people became victims of National Socialist euthanasia programs between 1940 and 1944. At the end of 1944, there was demolition work in the castle. The perpetrators tried to hide all material vestiges of the crime. After the war, the castle first served to house refugees, later it became a residence. A first memorial room for the victims was established in the 1960s. In 1995, the Schloss Hartheim Castle Society [Verein Schloss Hartheim] was founded with the goal of establishing a permanent memorial. In 2003, with the assistance of the State of Upper Austria and the Republic of Austria, the Schloss Hartheim Learning and Memorial Centre was opened with the exhibition "Value of Life". In the course of building the memorial, numerous structural remnants of the killing institution were found. In 2001, while the castle was being renovated, several pits were found accidentally during digging operations in the castle garden. In addition to structural elements that were demolished in 1944/45, some human remains as well as belongings of people murdered at Hartheim were discovered. As part of an extensive archaeological investigation of the eastern and southern surroundings of the castle, human remains were recovered which were then buried in an especially built cemetery area; about 8000 finds were recovered as well. The contribution establishes, on the one hand, what meaning these items have for research into the history of the killing institution and for the people who were murdered. On the other hand, there are to be considerations and discussions about possibilities of presenting the structural remnants and the finds in museum form and to use the latter for teaching projects.

05 BEYOND ARCHAEOLOGY. FINDING NAME TAGS AT THE EXTERMINATION CAMP OF SOBIBOR: WHAT TO DO?

Author: Drs Schute, Ivar - RAAP Consultancy (Presenting author)
Keywords: holocaust, archaeology, ethics
Presentation Preference: Oral

At the ongoing excavations in the former Nazi extermination camp of Sobibor the discovery of name tags or items with personal data on them, have an enormous impact. Not only on the archaeological team itself, but also the public interest and interest of the media seems to focus primarily on these artifacts. The processing and scientific and societal value of these finds will be discussed, and also its impact on the excavation itself, the research agenda and people involved.

06 PICTURES DON'T LIE? DEAD BODIES AND THE POLITICS OF HOLOCAUST REPRESENTATION

Author: Professor Dr Van Der Laarse, Robert - University of Amsterdam (Presenting author)
Keywords: Holocaust, representation, photography
Presentation Preference: Oral

Entering the territories of the Third Reich, the Allied 'liberators' were facing incredible deathscapes along the routes of the death marches from the Nazi concentration camps in Poland to German camps like Bergen-Belsen or Dachau. Photography and film convinced the outside world of Germany's collective guilt of war crimes, much like the Nazi's themselves had used photography to convince the world of Soviet war crimes in Katyń and other NKVD massacre sites. This may seem self-evident, as archaeologists are digging for truth and traces, but archaeology has never been an innocent discipline. Stones and bones played a pivotal role in Nazi propaganda as well as in truth finding and presenting evidence for war crime committees. In addition many of these sites have recently become musealized as trauma site museums in which photos and findings are used for visitor identification.
Interestingly, photography, archaeology and forensics play a prominent role in this dynamic of memory. This poses the question how big the impact of former war propaganda and the early visualisation of the camps by means of photography and investigations actually was and how it shaped our image of the 'death camps'. It may also ask for new interpretations of the ethics of representation in Holocaust crime scene investigations and museum exhibitions.
Thus transformed from evidence into the material testimonies of the Age of Terror in our current Age of Memory, the confrontation with dead bodies and human remains might have become tabooed in museum contexts, while dark tourism exploits the same atrocities as commodified experiences which as signs of trauma might easily fuel new hatred stirred by media and memory events. This conflicted heritaging of violent pasts asks for a transnational rethinking of Holocaust archaeologies and the politics of display.

07 DISTURBING ARCHAEOLOGIES. A THEORET(H)ICAL APPROACH?

Author: Dr Nicolis, Franco - Ufficio beni archeologici - Autonomous Province of Trento (Presenting author)
Keywords: Ethics, Fact, Truth
Presentation Preference: Oral

Archaeology is the search for fact, not truth. If it's truth you're interested in, doctor Tyree's philosophy class is right down the hall (Indiana Jones).
What is fact and what is truth in archaeology? When we are dealing with contemporary past, is there any difference between fact and truth? If yes, where is the border line?
These are some key questions we are coping with when we approach traumatic pasts, horror heritage, terrorscapes (WWI, Spanish Civil War, Holocaust, Balcan mass graves, etc).
New (or old) identities are built (or deconstructed) by using and misusing memory and history but also archaeological evidence. Archaeology could be manipulated by segments of contemporary society for unreasonable purposes.
In these contexts archaeology must act as a disturbing discipline, a critical minded one, giving no chance to the construction of false rhetoric narratives; moreover social participation or involvement must be welcomed but carefully dealt with. Archaeologists are speaking on behalf of missing witnesses: they must decide whose side they're on. Memory is never innocent.
Some case studies connected with WWI are presented.

08 HOLOCAUST MUSEUMS AND ARCHAEOLOGICAL EVIDENCE: OPPORTUNITIES AND CHALLENGES

Author: Dr. Ehrenreich, Robert - United States Holocaust Memorial Museum (Presenting author)
Keywords: Holocaust, ethics, collections
Presentation Preference: Oral

The common mission of Holocaust museums throughout the world is to memorialize the victims and educate people about its history and lessons. These institutions' development—and especially their exhibitions—necessitated the collection of artifacts that restored the victims' humanity, conveyed the sense of loss resulting from the annihilation of the Jewish communities, and documented the horrors of the tragedy. The only criteria for collection was the cost of obtaining the objects and the veracity of their provenance. Most museums now possess representative sets of artifacts that were acquired by purchasing from collectors or auction houses; donation by survivors, bystanders, liberators, or their families; and long-term loans from other institutions. Although ideal for exhibitions, these collections are too limited and contrived to support research. The increase in the number of Holocaust sites now being archaeologically excavated, however, is starting to provide sufficient, contextualized material to allow new insights into the local, regional, and transnational forced migrations and dislocations of populations; the development and administration of sites of persecution; the official, unofficial, and clandestine interactions among ghettos and concentration, labor, and death camps; and daily existence within these sites. Realizing that artifacts provide insights that purely archival collections cannot, some research institutions are now considering expanding their holdings to include objects beyond those for use in exhibitions. Although this expansion would provide new research opportunities, it also raises methodological and ethical questions: What artifacts should be collected, and what is a representative sample? What are the storage and conservation responsibilities of the different parties? What are the ramifications of appropriating evidence of a region's role in the Holocaust? Could such initiatives promote the "mining" of sites for artifacts versus legitimate research? Many of the issues associated with the collection of archaeological material by Holocaust museums worldwide will be explored in this paper.

09 ARCHEOLOGICAL CHALLENGES REGARDING THE BATTLE OF HOLOCAUST AND COMMUNIST MEMORIES IN CROATIA: JASENOVAC AND BLEIBUIRG CONTESTED WAR HERITAGE

Author: Dr. Bencic, Andriana - UvA (Universitat van Amsterdam); Jasenovac Memorial Site researcher and curator (Presenting author)
Keywords: Croatia, conflicted memories
Presentation Preference: Oral

Bearing in mind main challenges of Europe´s contested, conflicted and divided heritage of war, this paper builds upon two case studies which are clearly reflecting memory and identity wars in Southeastern Europe. Therefore, two main sites are taken into account: Jasenovac Concentration Camp – being the biggest Holocaust and mass atrocity camp in Southeastern Europe during WWII (1941-1945), and Bleiburg killing field (1945) - being the most representative site of Communist crimes that took place immediately after the WWII at the territory of former Yugoslavia.
In order to address the fundamental challenges of ˝Europe´s divided memory˝ (Assmann, 2013), the paper investigates competing memory representations and narratives embedded within contemporary Croatia (and former Yugoslavia) war heritage. It departs from the necessity to understand violent legacies of the conflicted past interplay of Nazi ustasha regime and Communist regime in nowadays Croatia, which also has a crucial influence on the construction of Croatian national identity.
The special focus will be given to the role of archeological findings as well as archeological possibilities that can contribute to better understanding of Croatian traumatic heritage, which has massively been misused in memory and identity politics in Croatia and in neighboring countries. Namely, the special emphasis will be placed on the role of materiality, or the role that archeologists and material culture could play in enhancing knowledge concerning the former Croatian Nazi and Communist conflicted heritage.

10 "CURATING THE HOLOCAUST": FINDING TREBLINKA, A TRANSDISIPLINARY EXHIBITION AT THE WIENER LIBRARY, LONDON, UK

Author: Mr Branthwaite, Michael - Staffordshire Univeristy (Presenting author)
Co-Author: Doctor/Phd Sturdy Colls, Caroline - (Presenting author)
Keywords: Art Transdisciplinary Exhibition
Presentation Preference: Oral

Ziva Amishai-Maisels highlighted that because art strives for beauty and personal expression it might be incompatible with communication relating to the Holocaust. However, following a forensic archaeological examination of Treblinka (as part of Staffordshire University's 'Finding Treblinka' project) new opportunities to use art and archaeology to aid understanding of the Holocaust were explored. Whilst the archaeological work offered the opportunity to re-evaluate the layout of the extermination and labour camps, the interactions between them, the nature of burial and body disposal, and post-liberation approaches to the investigation of Nazi crimes, art provided the opportunity for new discourses, both within historical and scientific narratives and the socio-political discussions and positioning of Treblinka. New knowledge and understanding generated by both disciplines offered the chance to reconsider the ways in which we process these historical events in relation to contemporary issues. This paper will consider the challenge of avoiding the potential 'pitfalls' set out by Amishi-Maisels in relation to bridging the gap between art and the Holocaust by offering the audience an experience that transcends both fields. The paper will focus on the 'Finding Treblinka' exhibition at the Wiener Library as a model for enriching the experience of gaining new knowledge by the integration of art works into

a combined exhibition. It will outline how the art works where chosen, in what way they became agents in the pursuit of materializing artistic responses to scientific data and how they became a conduit to greater historical knowledge. Crucially, this paper will demonstrate how interdisciplinary work can present opportunities for dialogues that provoke change in the way we think about history and its relationship with the present and why it is necessary to reflect on the ambiguity of forensic evidence and material culture in the context of the Holocaust

11 COMPETING MEMORIES: REMEMBERING AND FORGETTING THE HOLOCAUST IN ROME

Author: Mrs Bartolini, Flaminia - Univeristy of Cambridge (Presenting author)
Keywords: Memory, Holocaust, Heritage
Presentation Preference: Oral

The emergence of knowledge of the Holocaust in the post war period in Italy is bound up with problems of national identity and collective memory as the country attempts to integrate it into national histories and historiography. If the impact of the Holocaust was relatively limited compared with other European countries, the renegotiation of memory of the Holocaust (or failing to do so) has meant addressing (or failing to do so) problematic issues like legacies of Fascism, the history of the Resistance, and Cold War propaganda in Italian politics. The interplay between representation and collective memory of the Holocaust in Italy can be seen in the process of memorialization of places and opening of temporary exhibitions. This paper will look at recent temporary exhibitions curated by the Foundation of the Museum of the Shoah in Rome and compare them with previous exhibitions on the Holocaust. The work will examine the politics of memory leading to the creation of the Foundation of the Museum of the Shoah and how different meanings and interpretations emerged from exhibition displays and catalogues. It will also analyse commemoration events related to Holocaust Memorial Day like the so-called 'stumbling stones' and shifting approaches related to the role of the state, politics, and collective memory.

425 WHERE NEXT? CAREER PATHWAYS AND OPPORTUNITIES FOR EARLY CAREER ARCHAEOLOGISTS ACROSS EUROPE AND BEYOND.

Theme: 1. Twenty-five Years after Maastricht: Archaeology and Europe's future
Author: Orton, David (United Kingdom) - University of York
Co-Author(s): Frieman, Catherine (Australia) - Australian National UniversityCollins, Matthew (Denmark) - University of Copenhagen; University of York
Keywords: researcher mobility, internationalisation, career pathways
Presentation Preference: Round table

Despite increasing emphasis on internationalisation and mobility within European research (notably via the European Commission's Marie Skłowdowska Curie Actions), the sheer diversity of national academic structures and funding systems continues to present challenges to Early Career Researchers (ECRs) looking to build careers in archaeology beyond their country of primary training. Adding to the inevitable barriers faced by some archaeologists due to family responsibilities, migration policy, etc. limited awareness of potential international opportunities remains a key hurdle for those interested in living and working further afield.

Aimed especially at early career archaeologists, this session seeks to increase awareness of international opportunities via a series of 5-minute presentations (and associated question/discussion time) on the ECR landscape in a range of different national/regional systems, concluding with supranational European researcher mobility schemes. Each presentation - delivered by an invited speaker with experience of the system in question - will cover typical career pathways and associated terminology; funding opportunities for ECRs; and advice on practicalities for incoming researchers.

The briefings will be followed by a chaired discussion, taking a more holistic view of the situation across Europe and beyond. What are the major systemic problems facing ECRs? How do these vary between sub-fields of archaeology, and how might archaeology as a whole build upon the success of (for example) the archaeological sciences? What ways forward can we envisage?

01 EU-WIDE OPPORTUNITIES FOR EARLY CAREER RESEARCHERS

Author: Dr Collins, Matthew - University of York; Copenhagen University (Presenting author)
Keywords: Fellowships, Europe, Funding
Presentation Preference: Oral

I will consider options within Europe for Early Career Researchers with a specific focus on those opportunities funded by the EU Marie Skłodowska-Curie actions

02 BECOMING AN ARCHAEOLOGIST IN THE LOW COUNTRIES

Author: Dr. Cakirlar, Canan - Groningen University (Presenting author)
Keywords: Early-Career, Netherlands, Belgium
Presentation Preference: Oral

I will discuss the possible pathways for early career archaeologists in Belgium and Netherlands from an outsider's point of view.

03 SWEDEN

Author: Dr Klevnäs, Alison - Stockholm University (Presenting author)
Keywords: careers, researcher mobility
Presentation Preference: Oral

This short presentation will discuss opportunities for early career archaeologists in Swedish universities.

04 UNITED KINGDOM

Author: Dr Albarella, Umberto - University of Sheffield (Presenting author)
Keywords: Britain, careers, exchange
Presentation Preference: Oral

The UK academic world has been fertile ground for innovation and international exchange for many years. Although this remains the case, upcoming researchers who want to make their way to Britain currently face many challenges. Neo-liberally driven economic politics mean that culture has been devalued, and disciplines – such as archaeology - not perceived to provide (rightly or wrongly) an immediate and substantial cash return have been penalised. The imminent exit of the UK from the European Community also opens uncertain scenarios for the future. As an 'economic migrant' myself, as well as a mentor of many early career international researchers in the last twenty years or so, I have had the opportunity to experience many of the issues that potentially face academics in search of an international work experience. I will discuss background and provide some suggestions, based on first-hand experience.

05 SPAIN AND PORTUGAL. CHALLENGES AND OPPORTUNITIES OF BUILDING AN ARCHAEOLOGICAL CAREER ABROAD.

Author: Dr. Martin-Seijo, Maria - Grupo de Estudos para a Prehistoria do NW Ibérico-Arqueoloxía, Antigüidade e Territorio (GEPN-AAT). Dep. Historia. Universidade de Santiago de Compostela (Presenting author)
Keywords: Spain, Portugal, Career,
Presentation Preference: Oral

It will be presented a short overview of challenges and opportunities for Spanish and Portuguese researchers who are interested in building an archaeological career abroad.

06 EARLY CAREER RESEARCHER PATHWAYS IN GERMANY

Author: Professor Makarewicz, Cheryl - Christian Albrechts University, Kiel (Presenting author)
Co-Author: Dr. Anvari, Jana - Flinders University (Presenting author)
Keywords: Germany, Career
Presentation Preference: Oral

We will review the opportunities for early career archaeologists in Germany, discuss career pathways, and funding opportunities.

07 LIFE AFTER A PHD IN ARCHAEOLOGY. WHAT NEXT?

Author: PhDr., Ph.D. Maria, Taloni - University of Rome \ (Presenting author)
Keywords: post-doc, job opportunities
Presentation Preference: Oral

The presentation aims to underline the difficulty to continue the academic career in Italy after obtaining a PhD since the only chance seems to be collecting post-doctoral fellowships across Europe or beyond, changing country very often. On the other hand, if you decide not to travel, the realistic opportunities are to work again as freelance archaeologist, tour guide or temporary teacher, if possible, in the same way as after a master degree. In many cases it is necessary to do all these jobs together in order to remain employed in something related to the archaeological field. Doing so many early career archaeologists continue to study and to publish independently.

08 ITALY: A PERSPECTIVE ON ARCHAEOLOGY OUTSIDE THE UNIVERSITY SYSTEM

Author: Dott.ssa De Davide, Claudia - Akhet srl (Presenting author)
Keywords: italy, archaeology, private
Presentation Preference: Oral

The world of archeology in Italy in recent years has been subject to notable changes, many still ongoing; the real impact of these transformations upon this sector is not yet clearly understood.
This brief discourse intends to focus upon how these changes are influencing the private sector of the archeological companies which operate in the field on behalf of the various Italian Soprintendenze; companies composed of professional archeologists who on a day to day basis find themselves constrained to function in between, on one hand, the ethical and scientific needs of archeology and the custody of the Soprintendenze, and on the other, the building industry and the public tender system.

09 ARCHAEOLOGY IN THE US

Author: Dr Biehl, Peter - University at Buffalo, SUNY (Presenting author)
Keywords: USA, career paths
Presentation Preference: Oral

This contribution will highlight the various career paths for archaeologists in the US including tenure-track and adjunct positions, postdoc and PhD fellowships.

10 DOING ARCHAEOLOGY DOWN UNDER

Author: Dr. Frieman, Catherine - Australian National University (Presenting author)
Keywords: Archaeological Practice, Australia
Presentation Preference: Oral

I will be discussing career pathways in archaeology in Australia.

430 PREDICTING SOIL DISTURBANCES: KNOWLEDGE FOR INFORMED CHOICES IN ARCHAEOLOGICAL HERITAGE MANAGEMENT.

Theme: 6. Interpreting the archaeological record
Author: Lascaris, Michel (Netherlands) - Cultural Heritage Agency of the Netherlands
Co-Author(s): Meylemans, Erwin (Belgium) - Vlaamse Overheid Agentschap Onroerend Erfgoed, Belgium
Keywords: Soil disturbances, predicting them: strategy and methods
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Disturbance of the soil as a result of land excavation or deep ploughing, for example, can reduce or even destroy the information value of archaeological remains. Lack of awareness of such disturbances can lead to archaeological investigations being undertaken unnecessarily. Although the scale of the problem is not entirely clear, it is known that knowledge of locations where soil has been excavated or disturbed prevents unnecessary archaeological excavation and ensures that archaeological interests are more effectively taken into account in the spatial planning process.

In this session we will discuss methods of inventorying soil disturbances used in various European countries. Further we will discuss how this knowledge is used to predict the probability of disturbance of archaeological relevant locations and how this knowledge is used to fine tune predictive archaeological modelling.

01 PREDICTING SOIL DISTURBANCES IN THE NETHERLANDS

Author: Mr Lascaris, Michel - Cultural Heritage Agency the Netherlands (Presenting author)
Keywords: Disturbances, tillage, modern-agriculture
Presentation Preference: Oral

The Dutch development programme 'Archaeology Knowledge Kit' has produced a number of tools for archaeological heritage management in the Netherlands. One of the main objectives within the programme is predicting and determining the extent of manmade soil disturbances on the (potential) archaeological record.

Disturbance of the soil as a result of land excavation or deep ploughing, for example, can reduce or even destroy the information value of archaeological remains. Knowledge of locations where soil has been excavated or disturbed prevents unnecessary archaeological excavation and ensures that archaeological interests are more effectively taken into account in the spatial planning process.

In a densely populated country like the Netherlands all kinds of activities disturb the soil, and therefore also any archaeological information present. By far the most extensive disturbances are realized by the agricultural sector. The Netherlands is the second biggest exporter of agricultural produce in the world, after the United States. The high yields achieved in the Dutch agricultural sector are the result of decades of scaling up, high levels of fertiliser and pesticide use, and far-reaching mechanisation involving intensive tillage, especially in arable farming. Therefore the Cultural Heritage Agency of the Netherlands has:

- analysed the effects of different kinds of Dutch agricultural and horticultural tillage on the soil profile,
- inventoried existing datasets with information about soil disturbances,
- developed different desktop based methods for predicting disturbances,
- analysed the efficiency of different strategies of examining these desktop based predictions in the field (ground truthing).

In this paper we will present the results of these projects. What are the possibilities and limits of predictive models defining the extent of soil disturbances and which strategies of ground truthing are the most effective?

02 THE MAPPING OF 'AREAS WHERE NO ARCHAEOLOGICAL HERITAGE IS EXPECTED' IN FLANDERS (BELGIUM)

Author: Mr Meylemans, Erwin - flemish heritage (Presenting author)
Keywords: preventive archaeology
Presentation Preference: Oral

Since 1-07-2017 archaeological heritage management in Flanders (Belgium) is steered by a new legislation, providing a number of new instruments in light of preventive archaeology. One of these is the designation of 'areas where no archaeological heritage is expected'. In these areas no preventive archaeological procedure is required.
Although seemingly straightforward at first glance, the process of designation and demarcation of these areas is rather complex, drawing on a large number of different sources, and taking into account a large number of environmental as well as archaeological parameters.
In this paper we present the legislative background and the process of the built up of this map, and highlight the limits and merits of the different used sources. Finally we will sketch a number of possibilities for future developments of this mapping effort.

03 THE INTACTNESS OF THE SOIL IN THE MUNICIPALITY OF VEENDAM (PROVINCE OF GRONINGEN)

Author: Drs. breimer, jan - A=M (Presenting author)
Keywords: soil disturbances archaeology
Presentation Preference: Oral

Soil disturbances and their archaeological meaning is a relative new field of policy. The last few years several soil disturbances investigations were executed in the Netherlands. Opinions about these investigations differ.
When is the soil disturbed? And when it is, has the soil yet any archaeological value? In the beginning of 2017 A=M Adviespraktijk & Brijker Landschap executed a large disturbance investigation in the city of Veendam in the province Groningen.
In cooperation with 9 farmers 75 soil profile pits were created.
For the first time in history this kind of investigation was co-finaced by the farmers themselves. Results of this investigations show a different point of view when it comes to the intactness of the soil in Veendam.
The most important questions that pop up to this investigation:
Do the investigated parcels still have an archeological value?
Is there a possibillity for the city hall to handle this investigation in her archaeological policy?
And more interesting: Is tis type of investigation adequate to be executed in other municipalities?

04 DISTURBANCES AND ARCHAEOLOGICAL RELEVANCE OF A SITE: IT ALL BOILS DOWN TO INFORMATION VALUE

Author: Smit, Bjørn - Cultural Heritage Agency of the Netherlands (Presenting author)
Keywords: informationvalue, postdepositional processes
Presentation Preference: Oral

Recently but also in past archaeological research attention is given to the degree of disturbances of the archaeological record due to agricultural end building practices. Unfortunately in some instances these disturbances have been given to much weight in evaluative decisions in whether or not to dig. In the Netherlands we have a long tradition of making predictive models in which the archaeological potential of large areas is formulated. More and more effort is put in the gathering of information regarding large scale disturbances as a result of agricultural practices or building activities. This has resulted in discussions in which large parts of the landscape have been given a low archaeological potential due to the presence of disturbances. In this short presentation I would like to go back to the basics and that is that for each an every archaeological site the post depositional processes have to be assessed to establish the information value of that particular site (see the work of Schiffer). The effect of potential disturbances has to be researched just as well as the information value of the sites compared to known sites in the vicinity. Only then one can argue whether a site is valuable enough to protect, to excavate or to let go.

05 PREDICTIVE MODELLING OF SOIL DISTURBANCES: REGIONAL SOURCE DATA FOR MODEL INPUT AND VALIDATION

Author: PhD. Willemse, Nico - RAAP (Presenting author)
Co-Author: Ing. Keunen, Luuk - RAAP; MA Van der Veen, Steven - RAAP; Ir. Boshoven, Evert - RAAP; Drs. Veenstra, Haaije - RAAP
Keywords: geodata, soildisturbance, modeldevelopment
Presentation Preference: Oral

When using spatial modelling as a tool for predicting soil disturbances, gaining insight in the diverse types and quality of source data (as input data) may be cumbersome. In the Netherlands, digital geo-information of past public works (earth works for infrastructure, sewage) and agricultural land use abound, but typically provide only indirect information about soil disturbances. Moreover, metadata concerning the spatial accuracy of mapped soil interventions or the spatial homogeneity of disturbances are commonly lacking. Other types of geodata, such as those derived from soilmaps or archaeological surveys, often provide more primary information about soil disturbance (i.e. targeted observational data) but equally typically lack metadata on spatial accuracy and the homogeneity or inhomogeneity of observed soil disturbance. Other sources of data, such as respondent data (landowners), historical records (maps, land consolidation plans), or (digital) terrain elevation data, are less commonly used, albeit spatial metadata is equally difficult to valuate.
For the purpose of testing and validating predictive spatial models (commonly based on geostatistics) inventories of soil disturbances should include spatial characteristics (accuracy, precision, homogeneity). For model development in the Netherlands, we have addressed both aspects of inventorying soil disturbances in a regional study: source data and spatial characteristics. The results should primarily be used in conjunction with field validation, helping to answer an important methodological question: what datasources provide reliable unbiased predictors of soil disturbance and to what extent can they be incorporated in spatial predictive models?

439 GIS AND GEOMATIC APPROACHES TO HISTORICAL LANDSCAPE ARCHAEOLOGY: COMPARISONS FROM ONE SIDE TO THE OTHER OF EUROPE AND BEYOND

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Turchetto, Jacopo (Italy) - University of Padova
Co-Author(s): Chevassu, Valentin (France) - Université de Bourgogne-Franche- Comté
Keywords: Landscape Archaeology, GIS, Geomatics
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Geomatic applications to archaeology (spanning from 2D/3D GIS, cartography and photogrammetry to remote sensing and virtual/augmented reality) greatly developed during the last decades. They proved to be both very useful in carrying out scientific researches and also for their relevance in terms of communication of results to the general public: thus, they have become a robust part within the activities and skills of archaeologists.
These techniques and approaches turn out to work in a very satisfactory way when applied to landscape archaeology. However, it appears clear that significant differences exist at a regional level.
The aim of this session will be to take into consideration the different approaches and methodologies followed or developed within the framework of historical landscapes studies. The task will be to collect ideas coming from all over Europe and the Near East, in order to evaluate differences or similarities, as well as to verify the adaptation/utilization/exploitation of geomatic applications to different regions and to various types of data (with different levels of reliability/accuracy of the information, presence/absence of ancient written documentation). Efforts will be made to find a common guideline, which could take into account local peculiarities and tune good practices to the nature and the specific features of the multifaceted European regions.
This session will be open not only to theoretical and methodological papers, but also to case studies, provided they seek to emphasise inter-disciplinary and multi-disciplinary applications of GIS and geomatics to the classic and medieval age landscapes of Europe and the Near East.

01 RECONSTRUCTING, EXPERIENCING, AND MAPPING A MULTI-SENSORY VIRTUAL REALITY ENVIRONMENT FOR THE ROMAN TOWN OF CALLEVA ATREBATUM (SILCHESTER, HAMPSHIRE, UNITED KINGDOM)

Author: Dr. Krus, Anthony - University of Glasgow (Presenting author)
Co-Author: Dr. Ewart, Ian - University of Reading; Dr. Platts, Hannah - Royal Holloway, University of London; McLean, Kate - Canterbury Christ Church University; Royal College of Art
Keywords: GIS, Virtual Reality
Presentation Preference: Oral

This presentation provides a summary of a multi-disciplinary project funded in 2016–2017 by the Arts and Humanities Research Council that explored how to reconstruct, experience, and map a multi-sensory virtual reality environment for a first and second century AD house complex in Insula IX of the Roman town of Calleva Atrebatum (Silchester, Hampshire, United Kingdom).

We used gaming technology to create an immersive 3D virtual reality model of this Roman town house and neighbourhood, including not only the architectural elements but also sounds and smells that would have been familiar to the occupants. Data for the virtual reality model was taken from a combination of excavation records and classical texts describing the sights, sounds and smells of Roman life. Throughout 2016-2017, this interactive virtual reality model was presented at public outreach events so that users could experience the reconstructed multi-sensory environment (site, sound, and smell). Everyday smells were triggered through a 3d printed device as users move into different zones of the 3d virtual reality model while wearing a headset. Users could vary elements such as wind direction, time of day, and open/closed windows.

We explored the use of Geographic Information Systems (GIS) to map the multi-sensory virtual reality environment for Insula IX. Maps for sound and odour dispersion were created based on the data used in the 3d virtual reality model and modern weather data using both MASdBmap v5.0 and the Graz Lagrangian Model. We used GIS overlays of the archaeological data, the sound maps, and the odour maps to produce multi-sensory maps for the lived experience of Roman life. Displaying this multi-sensory information two-dimensionally proved challenging, but ultimately provided multi-scalar data that has greatly improved understandings for how sensory experiences shaped Roman life at Calleva Atrebatum.

02 HISTORIC IMAGES AS SPATIOTEMPORAL ARCHIVES: HISTORICAL 3D DATA AS A FORM OF ARCHAEOLOGICAL SOURCE CRITICISM?

Author: Dr. Sevara, Christopher - University of Vienna (Presenting author)
Co-Author: Dr. Doneus, Michael - University of Vienna; LBI ArchPro; Dr. Draganits, Erich - University of Vienna; LBI ArchPro; Dr. Verhoeven, Geert - LBI ArchPro
Keywords: terrain, DEMs, change
Presentation Preference: Oral

This paper will discuss the use of historic digital elevation models generated form archival aerial imagery for historic landscape analysis and heritage management. Using images from a number of case studies in Western Europe, the physical process of landscape change is reconstructed at discrete points in time, and these datasets are used to calculate geomorphic change in the environment and its impact on archaeological resources. Such datasets offer us the opportunity to evaluate the bias that the process of modern, large-scale physical modification of the landscape may impart to our interpretation of preceding human activity. Stacking a series of historical digital elevation models together provides a 4-dimensional spatiotemporal 'terrain data cube' that can act as a form of source criticism for a given landscape, with each discrete period of activity acting as an independent event that can be compared to its preceding and subsequent counterparts and juxtaposed with other data sources. Thus, this allows us to evaluate the processes that contributed to the shape of the landscape as we see it today from multiple temporal perspectives and compare these with what we see in the present. From this, we can attempt to understand and deconstruct the process of modern landscape formation and its impact on prior activity, rather than simply viewing the present as a result of past activity.
The aim of this paper, therefore, is not to discuss the process of creating geospatial information from historic imagery, but how these data may be useful for us from an analytical perspective, including evaluating their merits and limitations. In short, this paper will examine the following question: What information do we gain from observing the process of landscape change via historical elevation models that we cannot understand from other sources, or by simply viewing the result?

03 THE ROLE OF GIS TECHNIQUE TO DETECT ETRUSCAN FRONTIERS: THE CASE STUDY OF POPULONIA AND VOLTERRA TERRITORIES

Author: Dott. Di Paola, Giorgia - University of Foggia (Presenting author)
Keywords: GIS frontier territory
Presentation Preference: Oral

Research on the birth and on territorial organization of Etruscan cities has stimulated different approaches in the understanding of definition of related boundaries and frontiers. Frontier could range in depth and definition, and in their entanglement with topography, material culture, politics and religion. So, the methodological approach chosen to carry out the detection of Populonia and Volterra frontiers has been necessarily multidisciplinary and it has been based on:

- a detailed collection of data and knowledge from different sources, such as historical, archeological and epigraphic sources, archive documents, aerial photographs
- the set-up of a specific GIS, suitable to manage, to archive and to analyze the different kinds of data.

Furthermore, a special attention has been paid to the topographic location of sanctuaries and fortified settlements on the borders of Populonia and Volterra centres, in order to test their hypothetic role as territorial markers of the cities territories.
In this paper I will present results of my research, focusing on the period between the VI century BC to the III century BC, before Etruscans were incorporated within the Roman Empire. In particular, I aim to prove the important role of GIS spatial analysis tools to examine the locations, attributes and relationships between features in spatial data through overlay and other analytical techniques, in order to extract or to create new information and hypothesis.

04 GEOGRAPHIC INFORMATION SYSTEM, AN INDISPENSABLE TOOL TO RECONSTRUCT THE FOREST'S EVOLUTION OF EUGANEAN HILLS

Author: Doctor/Phd Paradis-Grenouillet, Sandrine - University of Padova (Presenting author)
Co-Author: Prof Brogiolo, Gian Pietro - University of Padova; Professor Chavarria, Alexandra - University of Padova; Phd student Giacomelo, Federico - University of Padova
Keywords: Pluridisciplinarity, GIS, forest
Presentation Preference: Oral

Forested landscapes represent the ecological inheritance of centuries of forest management to supply, among other products such as timber, barks and leaves, resins and wood-tar, the fuel necessary for crafts, industrial activities and domestic life (Bechmann , Cavaciocchi , Rackham). Plant fuel was the only available fuel until the end of middle ages or even of modern times in certain regions. Thus, to meet their demands for firewood past societies gradually modified, transformed and remodelled the landscapes they inhabited. Understand these evolutions, the relation between the societies and the forest requires a pluridisciplinary approach (including history, ethnography, archaeology, geography, archaeobotany etc.) in order to protect and promote them at different geographical scales (from local to global). Researches in progress, in the Marie Curie Fellow project THISTLE , focus on the forest landscape of the Euganean Hills (Colli Euganei, Padua-Italie) to better understand the origin of the biodiversity and the structure of actual forests.

For the research, the Geographical Information System is an indispensable tool to manage all data, both to develop the regressive cartography based on the study of all maps and cadastres available (recent and ancient) both to localise all archaeological remains indispensable for the understanding of the territorial organisation thought centuries, and finally to estimate the potential of the forests, the woods needs of human activities and the commercial roads at the scale of the territory. This tool plays a fundamental role in the understanding of the transformation of the forest landscapes.

The presentation proposes an illustration of numerous uses of the GIS in the understanding of forest landscape evolution and explains the various methodologies which are developed under this research program.

This project has received funding from the H2020-MSCA-IF-2014 under grant agreement No 656397 and participate al program european H2020 FP7 MEMOLA (dir J-M Civantos)

05 LANDSCAPE TRANSFORMATION AND SETTLEMENT ABANDONMENT IN THE LATE MIDDLE AGES: COMPARISON OF GIS APPROACHES IN CENTRAL EUROPE AND ENGLAND

Author: Mgr., Ph.D. Holata, Lukáš - Department of Archaeology, University of Exeter (Presenting author)
Keywords: landscpape archaeology, GIS
Presentation Preference: Oral

The aim of this contribution is to compare and contrast two regions – Central Europe (especially the Czech Republic) and England – in term of GIS application in the study of landscape transformation during the Late Middle Ages. There is a long tradition of the rural settlement research, and also an interest in the original theme of settlement abandonment has been recently revived in both regions. It is now perceived in the context of wider transformations of land-use and new procedures of landscape research, such as GIS with database applications and quantitative methods or LiDAR data, are used. Nevertheless, types of data sources available in every region are considerably varied – especially different types of rural settlements, punctuality of the extent and chronology of abandonment, presence/absence of information about currently occupied rural settlements, the amount of written sources and environmental data, development of new techniques (such as 'Historic Landscape Characterisation'), continuity of land-use or preservation of medieval ploughlands and other areas in original hinterland. For that reason, different GIS approach is required (in terms of selected procedures and analyses in a micro and macro scale level) and the reasons or factors behind the landscape transformations have to be assessed from a different point of view. The paper will focus on several case studies with interdisciplinary applications of GIS.

06 EXPLORING THE DESERTUM WITH GIS – A LANDSCAPE STUDY OF THE MONASTIC SITE OF ANNEGRAY (HAUTE-SAONE, FRANCE).

Author: Dr Marron, Emmet - Newcastle University (Presenting author)
Keywords: GIS, Desertum, Monasteries
Presentation Preference: Oral

The desertum is a regular motif in narrative accounts of the foundation of early medieval monastic sites – a remote wilderness, where the holy man and his followers can extricate themselves from the distractions of secular life and achieve a greater level of spirituality. The original monastic desert was that of St. Anthony in Egypt, however the term is used regularly in saint's lives in relation to monasteries founded in Post-Roman western Europe.
While it is becoming increasingly clear that the desertum (in some cases heremus) was essentially a motif used to emphasize the religiosity of early monastic founders through a clear separation with secular life, this paper will examine, in practical terms, the reality of the deserta in question.The Marie Curie funded ChroMoLEME project (The Character

of Monastic Landscapes in Early Medieval Europe) is using GIS to apply Historical Landscape Characterization to a number of early monastic settlements across Europe. The paper will present results from the core study area at Annegray in eastern France, founded by the Irish monk Saint Columbanus in 591 A.D. It will examine how the reality of the archaeological record and the landscape setting of the site contrasts with the assertion by Jonas of Bobbio that the monastery was founded in a vast wilderness, demonstrating instead that Columbanus' foundation was closely tied into the pre-existing local social and political networks.
The fact that this project incorporates numerous sites, in distinct geographical contexts, in a number of different states, means that it is well placed to provide an example of the challenges posed by applying geomatic approaches to areas with varying levels of coverage under the same overarching research question.

07 RECONSTRUCTION OF HISTORICAL ROUTES IN THE VELUWE

Author: Vletter, Willem - University of Vienna; University of Groningen (Presenting author)
Keywords: modelling roads GIS
Presentation Preference: Oral

In this paper I would like to present the results of the reconstruction of historical routes on the Veluwe push moraine in the Netherlands. The built least cost path (LCP) model incorporates the factors slope, terrain and ground water levels. Indeed, through combining these three factors in the model, it is capable to include possible wet areas in the past, which have probably determined the routing in the Netherlands more than the slope factor. The latter is often the main ingredient for route modelling.
The strength of the model lies in the possibility to differentiate between factors, its simple adaptability for different routing and its fast calculation on a simple personal computer. The model has been tested on four routes across the Veluwe with a known historical depth. Moreover, these four routes cross the push moraine in a different way. In the end, the LCP model shows interesting results regarding the influence of the three factors on these routes. Especially, the comparison between the routes provides new knowledge.

08 WHERE SHOULD I GO? GENETIC ALGORITHMS AND THE ROUTES OF ROMAN-BYZANTINE CAPPADOCIA (CENTRAL ANATOLIA)

Author: Dr Turchetto, Jacopo - University of Padova (Presenting author)
Co-Author: Mr Titti, Giacomo - University of Padova
Keywords: GIS Roman-Byzantine routes
Presentation Preference: Oral

This paper focuses on a GIS-based research aimed at reconstructing the Roman-Byzantine routes of the central sector of Cappadocia (Anatolia). Taking into consideration the various typologies of settlements (towns, villages, stopping places or fortresses) and their distribution within that region, we have approached the issue from the perspective of the Travelling Salesman Problem (TSP). Given a list of points and the distances between each pair of them, which is the shortest route that visits each point exactly once and returns to the origin point?
With reference to our purposes, we have implemented a meta-heuristic algorithm based on Genetic Algorithms to find out the shortest path, starting from the Roman and Byzantine town of Tyana, modern Kemerhisar. The algorithm has been built limiting the maximum journey distance between each pair of settlements to 25 km and setting the maximum degree of slope along the track at 8%. Then, other factors of journey 'friction' or 'facilitation' (presence of rivers, lakes or canyons; better level visibility 'from the roads' or 'of the roads') have been added.
The GIS-derived results have been compared with the pathways of the routes recreated in a 'traditional' way, i.e. on the basis of archaeological and topographical data. All this allowed to evaluate the road system of central Cappadocia through a postdictive method, and to better understand which factors (anthropic or natural) played a major role in defining the roads' layout of that stretch of the Anatolian peninsula.

442 ARCHAEOLOGY IN EUROPE / EUROPEAN ARCHAEOLOGY

Theme: 6. Interpreting the archaeological record
Author: van Rooijen, Cees (Netherlands) - Rijksdienst Cultureel Erfgoed
Keywords: artist, contours, landscape, preparation, rock-art
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

General session

01 THE ARCHAEOLOGICAL SURVEY IN DIFFERENT LANDSCAPE: SOME EXAMPLES OF SURVEYS CONDUCTED IN ITALY

Author: Prof. Mosca, Annapaola - University of Rome (Presenting author)
Keywords: Surveys, landscape, Italy
Presentation Preference: Oral

During archaeological surveys I carried out in various parts of Italy (in Sicily, on the Island of Pantelleria, in Central Italy and in Northern Italy), I used different methods of investigation, both intensive and extensive, often integrated, connected to the type of land that I had to investigate and to problems encountered on the ground (mountains, rivers, coastal sites, rocky ground) and with the use of soil (e.g. quarries, different cultures). However the aims of the archaeological survey are to enable us to identify the archaeological evidence and to reconstruct the features of the settlement in order to rebuild the ancient landscape in connection with the surrounding area and the environmental characteristics.

02 DECORATION TYPES OF MEDIEVAL SHEATHS FROM ELBLĄG (VOIVODESHIP: WARMIŃSKO-MAZURSKIE, POLAND)

Author: Master of Arts Kulesz, Aleksandra - Nicolaus Copernicus University in Torun (Presenting author)
Keywords: medieval, leather, sheaths
Presentation Preference: Poster

Different types of sheaths were very popular accessories in medieval times. Most common were covers for multipurpose knives (daily, hunting, combat). On poster showed ways of decoration of sheaths discovered in Old Town in Elbląg. Discussed most popular decorative technics like stretching, pressing, using punches or small, metal, decorative elements. It was also considered which profession of leather craftsmen were responsible for making those works. Compared different types of decoration with time of functioning individual objects and checked if purpose of scabbard defined type of form and motives of decorations used on it. Finally compared styles of decorations with covers from other parts of Poland and Europe in order to demonstrate similarities.

03 A SINGING BONE FROM MEDIEVAL TURKU, FINLAND - SWEDISH OR GERMAN IMPORT, BALTIC INFLUENCE OR VARIATION ON A FINNISH THEME?

Author: Doctorandus (Drs.) Tamboer, Annemies - independent researcher (Presenting author)
Co-Author: FT Rainio, Riitta - University of Helsinki
Keywords: music archaeology
Presentation Preference: Poster

A sheep metatarsal with three holes excavated in the medieval Convent Quarter of Turku, Finland was dated as between the 13th-16th centuries. The holes suggest that it was a wind instrument, but it lacks parts such as a window and a lip or a sharp rim that produce sound when blown. Probably a reed was inserted in the man-made hole in the proximal end of the bone. As a reedpipe, the Turku find is similar to the läveri, if a horn bell was attached, to a lävikkö, both folk reed instruments from Finland for which records do not go back further than the 19th–20th centuries. A sheep metatarsal with two finger holes from Åland, Finland, dating from the 11th century is may also be interpreted as a reedpipe. These finds give evidence that reedpipes or hornpipes were played as early as the 11th and 13th-16th centuries in the area of modern Finland. The Finnish folk reed instruments läveri and lävikkö, however, were traditionally made of wood. Was the bone reedpipe an import from abroad, as Turku in medieval times had many inhabitants from Germany and Sweden and had frequent contacts with Baltic regions, or was the use of bone for the Turku reedpipe a variation on medieval Finnish instruments made of wood ? Up to now, similar archaeological instruments from Germany, Sweden and the Baltic are not yet known, so an interpretation as a medieval bone version of Finnish folk reedpipes is tempting - but not conclusive.

04 LAND VALUE FROM CADASTRAL MAPS AS A QUALIFYING APPROACH TO LANDSCAPE ARCHAEOLOGY

Author: Mrs. Borake, Trine - University of Aarhus (Presenting author)
Keywords: Cartography, landscape, dynamics
Presentation Preference: Oral

Land value figures has been proven useful to single out specific settlement areas. By using the cadastral maps of Scandinavian from the end of the 18th century, I will apply a retroperspective supplementary approach to landscape analysis of the Viking Age and early medieval period. Areas with high land value often demonstrate a higher quantity and quality of artifacts signifying substantial settlement areas compared to surrounding areas with lower land value. Whether this is caused by a preference to settle on good quality land or whether the value of the land has been increased by settlement-debris has been widely discussed. Either way, by thematizing the cadastral maps according to value, known and deserted settlement areas will stand out contributing a much more detailed settlement pattern. We can furthermore assessed these settlement areas according to topographic elements such as access (e.g. from 2D mapping) and outlook (elucidated by sky view factor). Compared with an analysis of symbolic elements such as closeness to e.g. mounds and water the settlement areas can be qualified on various levels. This is a useful approach, that on one hand point to extended settlement patterns and on the other qualify detector finds in otherwise deserted areas. The method will be demonstrated by a casework done on the local area of Lake Tissø in western Zealand, Denmark were an significant Viking age central place is located. I will discuss the methodology and the results of the land value analysis.

05 NUTRITIONAL POTENTIAL OF LATEGLACIAL LANDSCAPES – PRELIMINARY RESULTS ON A QUANTITATIVE RECONSTRUCTION OF LATEGLACIAL VEGETATION BASED ON HIGH-RESOLUTION POLLEN DIAGRAMS

Author: Krüger, Sascha - Zentrum für Baltische und Skandinavische Archäologie (ZBSA) (Presenting author)
Keywords: palynology/hunter-gatherer/Lateglacial
Presentation Preference: Poster

Geological surveys in the area of a former meltwater lake in Schleswig-Holstein (Germany) yielded undisturbed Lateglacial sediments near Palaeolithic hunting sites (Hamburgian and Ahrensburgian). Preliminary palynological investigations of these lake deposits confirmed the existence of sediments reflecting the transition from Allerød to Younger Dryas. Furthermore, a laminated sequence could be identified in the lake stratigraphy that is the so far only known annually layered Lateglacial sequence in Schleswig-Holstein. These deposits in combination with the archaeological record make possible detailed multidisciplinary analyses and an evaluation of Lateglacial human-environment-interactions.
In the frame of the CRC 1266 "Scales of Transformation", the evaluation and some of these analyses are performed as part of a PhD project. These investigations (pollen analysis, loss on ignition, macrofossils, micro-charcoal analysis) aim for a better understanding of resource supply and exploitation strategies during the Lateglacial in the area of modern Schleswig-Holstein using a GIS-based mapping of vegetation patterns according to Lateglacial chronozones in search of most suitable habitats of preferred game animals.
Here I present the preliminary results of the palynological analysis that form the high-resolution dataset of the study. The given samples cover the Allerød-Younger Dryas-transition and reveal the early Younger Dryas deforestation to examine whether riparian forest still existed during glacial stages of the Lateglacial. Moreover, the study searches for distinct peaks in charcoal concentration to identify anthropogenic occupation phases of the littoral zone.

06 WORKING TOWARDS INCLUSION: DISABILITY, ARCHAEOLOGY, AND THE PLIGHT OF DISABLED ARCHAEOLOGISTS

Author: Ms Pageau, Hanna - University at Albany (Presenting author)
Keywords: ableism, survey, archaeologists
Presentation Preference: Poster

Intersectional, Inclusive, Accessible - these are words we hear often in archaeology. Our word is interdisciplinary and often intersectional in nature. We work towards being inclusive of any group of individuals both in our workplaces and in our studies, however, there are often groups who fall through the cracks. When it comes to the place of disability in archaeology there is a noted lack of attention paid towards making the field inclusive of those with chronic issues. This poster presents the results of a survey of archaeologists who are effected by physical, mental, cognitive, or other debilitating conditions with a focus on how to make the field not only more inclusive, but how to give better visibility and attention to an often forgotten about marginalized group.

07 SHEDDING LIGHT ON DUN DEARDAIL, LOCHABER: INVESTIGATING A VITRIFIED HILLFORT IN HIGHLAND SCOTLAND

Author: Dr mclaren, dawn - aoc archaeology (Presenting author)
Co-Author: Mr cook, martin - aoc archaeology group; Dr heald, andy - aoc archaeology
Keywords: Scotland, Vitrification, hillfort
Presentation Preference: Oral

The vitrified hillfort of Dun Deardail, Lochaber, Scotland occupies a spectacular position overlooking Glen Nevis in the Highlands, its dramatic location made all the more special by Ben Nevis looming opposite. The hillfort, which has not been subject to excavation previously, has been the archaeological focus of a three-year Forestry Commission and HLF-funded project undertaken under the auspices of the Nevis Landscape Partnership.
For three summer seasons between August 2015 and August 2017, AOC Archaeology Group has been working with Forestry Commission Scotland and the Nevis Landscape Partnership to undertake excavations within the hillfort, investigating aspects of the rampart's construction, the vitrification process as well as to explore the character and chronology of occupation both in the interior of the fort and in its immediate environs. This project presents a rare opportunity to evaluate a vitrified fort using modern techniques, and it the largest investigation of this site type in recent years. At least two phases of activity at the site have been identified by excavation so far indicating pre-and post-vitrification occupation which has produced a series of radiocarbon dates demonstrating activity ranging from the sixth to first centuries BC. Complimenting the excavation, the hillfort and its immediate environs have been investigated through a detailed geophysical survey, a coring programme to investigate new techniques of fire-history modelling as well as more traditional pollen analysis to reconstruct the vegetation history of the site.
Features, including a possible composite hearth which may have saw limited use for metalworking, the identification of a rampart wall core amongst the rubble and well preserved stratigraphic sequences of occupational layers. Although artefacts from the site were scarce, metalworking waste and a crucible attest to ferrous and non-ferrous metalworking, whilst stone and iron tools indicate more commonplace activities such as hide processing and food preparation.

08 WHAT TRACES XYLOPHAGOUS INSECTS LEAVE INTO THE ARCHAEOLOGICAL WOOD ? ANALYSIS AND INTERPRETATIONS OF ROMAN WOODEN FROM REZÉ'S DOCK.

Author: PhD student Toriti, Magali - University of Maine (France) (Presenting author)
Co-Author: Prof Durand, Aline - University of Maine (France); Mr Forher, Fabien - CICRP
Keywords: Wood Xylophagous interdisciplinary
Presentation Preference: Oral

The entomology's contribution applied to xylological study is a recent approach in archaeology.
This method, usually applied in the heritage conservation community, allows to identify the insects and especially the wood-borer pests remains (galleries with larva's excrement) that xylophagous leave into the living wood, into cut, used and no more used wood.
The objectives of this interdisciplinary study are :
- To understand the wood condition (was it sane, treated, without bark, sick, young ...? When the wood was infested ?),
- To further characterize human choices of wood, especially when they are infested, and the reasons of these choices, as well as their possible protection against xylophagous pests.
The harbour of Rezé Saint-Lupien delivered hundreds of water-filled wooden elements (stakes, planks ...) from the first and second centuries of our era.
Some of them have been infested in forest, others have been stored for several months infested, others have been attacked after they have been put in place.
The identification of these pests helps to understand the different phases of use and life of these woods and enriches the archaeological interpretations.

09 IMPRINT OF ACTION: THE SOCIOCULTURAL IMPACT OF PUBLIC ACTIVITIES IN ARCHAEOLOGY

Author: PhD student Boom, Krijn - Leiden University (Presenting author)
Keywords: sociocultural, impact, archaeology
Presentation Preference: Poster

People attribute values to their heritage, and as a result may consider archaeology to be an important part of their lives. This valuation flows from individuals or groups to their archaeological heritage. However, archaeology also has a strong impact on individuals and communities all over the world, thus creating a cyclical interaction between heritage, archaeology, and society.

The economic impact of archaeology has been the subject of various studies in the last decades, but the sociocultural impact of archaeology has only recently gained attention. The main instigator for this is the growing pressure on governments to deal with rapidly increasing societal change. As a result, the importance of the sociocultural impact of archaeology has been acknowledged by institutions such as the European Union, UNESCO, and ICOMOS. However, there are as yet very few studies focussing on how to evaluate and measure sociocultural impact in archaeology.

This research focusses on how to implement methodologies used in sociocultural impact analysis within the archaeological sector and how to interpret the resulting data. The focus lies on public archaeological activities because these provide a platform where people interact with archaeology, and within which they can be asked to share their

thoughts and opinions on archaeology and how it impacts their lives. Three European activities were selected as case studies; the DOMunder exhibition (the Netherlands), the You(R) Archaeology international contest, and the Invisible Monuments trail (Greece). Online and offline questionnaires, combined with qualitative interviews generated unique data on how these activities affected the participants. The social context provided by the activity and the level of involvement the individual has, are proven to be the strongest indicators for level of impact. This poster presentation will discuss how various factors influence the impact archaeological activities have on participants and the implications this has for the archaeological sector.

10 HUMAN SEASCAPES AND RITUAL ACTION: MODELING THE MARITIME MOBILITIES OF THE GREAT GODS OF SAMOTHRACE

Author: Dr Blakely, Sandra - Emory Universirty (Presenting author)
Keywords: Seafaring, Aegean, Cults
Presentation Preference: Oral

The maritime promises of the mystery cult of the Great Gods of Samothrace were the least secret aspect of a famously well-kept mystery cult. From the sixth century BC to the fourth century CE, the island's gods were the recognized masters of maritime safety, and initiates into their mysteries the beneficiaries. These promises have been the least expored question in the investigative history of the cult. The lacuna reflects, in part, the absence of well defined, archaeologically rigorous methodologies for exploring ancient maritime mobility. Samothrace offers a case study for the potential of digital technologies in exploring ancient mobility. We begin with the hypothesis that the cult worked: its initiates sailed a safer sea than other travelers. During the densely networked, politically volatile Hellenistic period, the island was one of the most active dispensers of proxenia, a civic honor which lowered port taxes, enabled communication, and assured non-aggression. These inscriptions have formed the basis of our Samothracian database, whose geospatial (ArcGIS) and human social network (GEPHI) reach we have analyzed, and brought together for study using Django. Our analyses suggest a sparse, scale-free network, resilient to interruption, and capable of supporting a Monte Carlo analysis to reveal a model of the cult's emergence as a bottom-up phenomenon, the organic collusion of multiple smaller regional networks. Our most recent venture is the gamification of our data in a Unity development platform. The project lets us approach the question of agency through choices made by contemporary players, operating in a simulated environment attentive to the material factors of wind, current, celestial guidance and topographic markers, and to the anthropogenic factors of mythic narrative, local resources, and the human social networks which would help sailors determine the routes and ports most calculated to serve their interests.

11 ARCHAEOLOGICAL INVESTIGATIONS AT AN 18TH-CENTURY DUTCH FUR TRADERS HOUSE ON BURLINGTON ISLAND, NEW JERSEY

Author: M.A Bello, Charles - Federal Emergency Management Agency (Presenting author)
Co-Author: Prof Viet, Richard - Monmouth University; Prof Dillian, Carolyn - Coastal Carolina University; Prof McHugh, Sean - Monmouth University
Keywords: colonial, United States
Presentation Preference: Poster

This poster focuses on archaeological and historical investigations conducted between 1891-1894 at the site of a Dutch fur-traders house on an island in the Delaware River outside of Philadelphia. These excavation are the earliest example of historical archaeology conducted in the Delaware River Valley.

In 1623 the ship Niew Nederlandt, commanded by Cornelius Jacobson May, deposited a small contingent of Walloon settlers, originally from Belgium, on the island. The settlement included a trading house, designed to capitalize on commercial opportunities with local Native Americans, and a palisaded fort know as Fort Wilhemus. In 1625, Willem van der Hulst was dispatched to Niew Nederlandt as Provisional Director of the first seat of Dutch government.

12 UNIQUE SPUR FROM THE WIELBARK CULTURE CEMETERY IN MAŁE CZYSTE (CHEŁMNO LAND, POLAND)

Author: PhD student Pronobis, Maria - Institute of Archaeology Nicolaus Copernicus University (Presenting author)
Co-Author: Dr Bokiniec, Ewa - Institute of Archaeology Nicolaus Copernicus University
Keywords: spur,wielbark culture
Presentation Preference: Poster

The turn of the ages in Pomerania and Chełmno land brings significant changes to many of features of Oksywie culture. The changes are so strong that it was considered reasonable to distinct here in the 1st century AD a new cultural unit - Wielbark culture.

Wielbark culture grave goods did not include weapon instead, jewelry and elements of costume occured. For this reason we hardly know anything about the armaments of this population. It is also difficult to determine the sex of dead person on the basis of grave gifts. For this reason, the cemeteries of the Wielbark culture have "female" character. A very limited number of male burials contained spurs – the only object in the entire grave assemblage related to a worrior's equipment.

A unique spur from the cemetery in Małe Czyste was found in cremation grave, dated to the end of 1st century AD.

After a conservation of the spur appeared an unusual decoration of a spike in the form of a double circle, probably inlaid with gold, not seen before among other such spurs. This demonstrates the high-skill of the local metalworkers inspired by artifacts from other cultures.

13 THE ISSUE OF PROVENANCE: LOOTING, REPATRIATION, AND THE ENCYCLOPEDIC MUSEUM

Author: Assistant Curator of Visual Resources/ Rights and Reproductions Ray, Ashley - Washington University in Saint Louis (Presenting author)
Keywords: Cultural Heritage, Museum
Presentation Preference: Oral

It is common for looted and stolen art objects to clandestinely make their way to art dealers, auction houses, and private collectors. However, some of these ill-gotten gains also currently reside in the collections of established institutions. Many of these pieces landed in the hands of collectors and museums as a result of the imperialism of the 18th and 19th centuries or the wars of the 20th century, while
some are currently being brought up from the ground in war-torn Syria and Afghanistan. These objects pose a plethora of problems regarding ethics and responsibility.
For collecting institutions, issues of provenance can be precarious and tricky territory. This paper will follow certain objects on their journey from their country or community of origin to their current location. It will focus not only on purchases and loot from earlier centuries, but also today's current black market for art and antiquities. The paper will

conclude on the issue of repatriation of objects, and how museums can look at these requests not necessarily as a negative event, but perhaps as an opportunity to form a connection with a source country or community that did
not exist previously.

14 BIOSPHERE MAPPING- THE NEXT STEP.

Author: Prof Evans, Jane - British Geological Survey (Presenting author)
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Keywords: biosphere, Sr-isotopes, migration
Presentation Preference: Oral

The current strontium isotope biosphere variation map of Britain has been well used (122 citations since publication in 2010) however it has limitations. These include: inconsistent data coverage; variable sample types; no assessment of the robustness of the data distribution and boundaries; limited accommodation for superficial deposits such as glacial moraines; no estimate of how gradational the boundaries are and finally the map is difficult to update when new data are generated. Furthermore the "measure and match" approach, used in all the currently published Sr biosphere maps, makes understanding the inherent uncertainty in creating the isotope domains difficult to communicate. In order to address these issues we are developing a model for isotope biosphere variation based on the interaction of geological, climate and geographic contributions.
The overall aim of this project is to develop a multi-layer, multi-purpose resource that can be interrogated for archaeological, environmental, food security and ecological studies by linking geographically distributed isotope variation with environmental data. This presentation will describe the issues related to producing such maps and what the final map will look like and how it will operate.

15 THE BINDING ROLE OF ARCHAEOLOGY IN COMPARATIVE MYTHOLOGY

Author: PhD. GÜVEN, Evrim - (Presenting author)
Keywords: Archaeology, Comparative Mythology
Presentation Preference: Oral

Ever since the Industrial Revolution, the division of labour tragically prompted, not only alienation of modern society, yet also specialization in science. Such compartmentalization of truth was indeed inconceivable throughout most of the archaic Antiquity as well as the entire Middle Ages.
This phenomenon was ironically opposite of the genuine sense of science which is rather an infinite and tightly interwoven net of material or spiritual structures. Therefore, scholars who came to be secluded and segregated in their departments, have forgotten to endeavour to see the whole picture although they managed to deal with problems in depth. Comparative approaches in Anthropology contributed to assist Archaeology which struggles with this unprecedented crisis in science. The elusive concepts of ancient civilizations, such as their religious beliefs, are often reflected upon material culture, which comes under the domain of Archaeology. The system of values proper to any society offers, indeed, an insight into the dynamics that underlie the cultural paradigms of its individuals.
Mythos served as the main vehicle for conveying implicitly such moral and spiritual principles throughout Antiquity. As are manifested on the inscriptions of cuneiform tablets along with the iconography of seals and frescoes pertaining to the palatial societies particularly in Near East, they even reveal a koine that cross the boundaries, where everyone could draw on its points of reference.
In this paper, we will demonstrate how comparative analyses of myths as they appear on archaeological finds, could improve our understanding of ancient Near Eastern civilizations. However, we will also explain how a certain level of awareness are crucial for avoiding to fall into the pitfalls of minimalist and maximalist opinions.

16 CONTRIBUTION OF GEOGRAPHIC INFORMATION SYSTEM IN DEFINITION OF HUMAN ACTIVITY AREAS IN MIDDLE PALAEOLITHIC. EXAMPLES OF CAOURS AND BEAUVAIS (FRANCE).

Author: Moreau, Gwénaëlle - Université de Liège (Presenting author)
Co-Author: Locht, Jean-Luc - Laboratoire de géographie physique (LGP, France); Institut national de recherches en archéologie préventive, (Inrap, France); Patou-Mathis, Marylène - Histoire Naturelle de l'Homme Préhistorique (HNHP), CNRS : UMR 7194; Auguste, Patrick - Evolution-Ecologie-Paléontologie (EEP), Université des sciences et technologies de Lille 1, CNRS : UMR 8198
Keywords: GIS, Activity Areas
Presentation Preference: Oral

During middle Palaeolithic, northern France was occupied only by Neanderthals groups. However, the succession of glacial and interglacial periods explain a complex and discontinuous settlement, which involved complication in the study of the population dynamics at regional scale. Thereby, some aspects of Neanderthals behaviour are still obscure: in many cases, the sites function have to be precise. The intrasite spatial analysis will help us to answer those questions through the description of human activity areas and their interactions. However, for Middle Palaeolithic sites, we can't see systematically on the field the spatial organisation directly, we sometimes need modelization. Therefore, we started to build a spatial analysis protocol based on a Geographic Information System and rely on sites of Caours and Beauvais (France). They are two open air sites that are exceptionally well preserved and displaying a large amount of faunal and lithic rests. Our protocol's aim is showing the existence of a spatial organisation in form of artefacts concentration area. We first hypothesize with mesh analysis – or density, widely used in archaeology. Nevertheless, this method is limited by subjective choices like that of the mesh analysis. For that reason, we decided to use another methodology based on artefacts density but also on the distance between each other: The Kernel Density Estimation. Then, we will specify the function of these areas in a life space and their interactions through the spatial distribution of different lithic artefacts and faunal remains.

17 FROM THE ROLLRIGHTS TO STONEHENGE A MEASURE

Author: wakefield, james - retired (Presenting author)
Keywords: Ancient measures
Presentation Preference: Oral

That there existed a common measure in regions of Germany, France, Italy and the UK is certain.
From the wonderful triangle at Crucuno, Ploulharnel and it's alignment to the equinoctial sunsets; To midwinter sunrise; To midwinter sunset all the way to Stonehenge a common measure was used.
This measure has many names and many purposes;
1. Saxon foot used in early England, Scotland, Wales and Ireland
2. Drusian foot named after a Roman general
3. Northern foot found in parts of Italy.
4. Indus Valley foot
The measure is a foot of 13.2 inches with a yard of 39.6 inches incredibly nearly the modern meter. 39.6 inches = 1.00584 meter.
http://www.dozenalsociety.org.uk/pdfs/Rollrights08.pdf

18 HOMININ MOBILITY AND THE EVOLUTION OF GENERAL COGNITION

Author: Dr Bouissac, Paul - University of Toronto (Presenting author)
Keywords: evolution, cognition, mobility
Presentation Preference: Oral

The archaeological record bears witness to improvements over time in the capacity of hominins to survive an increased diversity of physical and social environments through a range of innovative technologies. Cognitive evolution broadly coincides with the successful mobility of Homo erectus over distant and diverse lands. Such an obviously adaptive behavior is generally considered to be the result of the emergence of "general intelligence" by natural selection. The factors at play in this evolutionary phenomenon are the object of on-going debates (e.g., Burkart et al. forthcoming, for a review of the relevant literature). The purpose of this paper is to propose a hypothesis that links hominin mobility with the natural selection of cumulative cognitive competencies ultimately leading to "general intelligence", that is, the ability to solve novel problems. Starting with a review of the circumstances which may have prompted the first migrations, the paper argues that mobility entails exposures to an open-ended array of environmental challenges (geographic, climatic, floral, and faunal, as well as consequential changes in the diet, e.g., Previc 2011, social structures, e.g., Migliano et al. 2017). All these factors necessarily select for adaptability with respect to unpredictable challenges rather than the relative stability of the affordances of a niche. In conclusion, a comparison is tentatively made with a similar phenomenon (mutatis mutandis) in the invertebrates (cephalopods) among which some species of octopuses have evolved a well-established range of general cognitive competencies that includes a relatively high level of adaptability and innovativeness. This cognitive features correlate with a mode of hunting and foraging which select for engagement with novel objects and territories (Mather and Scheel 2014; Darmaillacq et al.2014; Godfrey-Smith 2016).

19 BACK TO EZINGE – THE HABITATION HISTORY OF A TERP SETTLEMENT

Author: Dr. Nieuwhof, Annet - University of Groningen (Presenting author)
Keywords: Interpreting old excavations
Presentation Preference: Poster

Between 1918 and 1939, the terp of Ezinge (province of Groningen, The Netherlands) was commercially quarried for its fertile earth, like so many other terps in the northern Netherlands. The remains of houses that were uncovered in this artificial dwelling mound caught the attention of pioneering archaeologist dr. Albert Egges van Giffen. Between 1923 and 1934, excavations were carried out in this terp under his direction. About 10% of the terp was excavated, in as many as 22 levels and covering a height of 5 metres in the centre of the terp. The excavations attracted international attention because of Van Giffen's modern excavation methods and because of the spectacular remains of spacious, 3-aisled, two-partite farmhouses with built-in byres from the pre-Roman and Roman Iron Age, unknown until then. Ezinge became a type-site of northwest-European settlement research. Despite the high expectations these excavations created, however, the results were never fully published.
The excavation campaigns resulted in a large and well-documented dataset, which allows a detailed analysis, even now. Thanks to grants from different organizations, the analysis and publication of the excavation results started in 2011. The poster will give a general overview of this research project and highlight some of its results.

20 A PALAEODEMOGRAPHIC STUDY OF THREE MULTIPLE BURIALS FROM STANS, SWITZERLAND

Author: Somers, Joke - University of Bern (Presenting author)
Co-Author: Dr. Fetz, Hermann - Office for Public Records and Archaeology Nidwalden; Dr. Lösch, Sandra - University of Bern
Keywords: bioarchaeology, multiple burials
Presentation Preference: Poster

The study of multiple burials within communal medieval cemeteries has long been neglected. Only the past two decades research on this topic has been carried out. However, in Switzerland there is still a dearth of knowledge regarding multiple burials. Hence, the purpose of this research is to contribute to the understanding of this burial type. An excavation in Stans (Switzerland) recently revealed parts of a cemetery associated with the St. Peter and Paul's parish church. A total of 168 individuals were recovered dating between the 8th and 19th century. Within the cemetery three multiple burials could be identified which were radiocarbon dated to the 15th-17th centuries. The skeletons showed no signs of violence or specific pathological lesions and were deposited simultaneously. By studying the demographic profile of the individuals interred in these mass grave complexes the aim of this study is to identify the origin of these multiple deaths. The results demonstrate anomalies in the demographic profile with a total absence of neonates and an overrepresentation of young children, adolescents, and young adults suggesting an epidemic event. Additionally, there appears to have been a greater 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. Based on historical sources the multiple deaths in Stans might be attributed to the plague. Nevertheless, aDNA analysis should be conducted to confirm this theory, as well as, exclude alternative causes of death.

21 STATISTICAL ANALYSIS OF CHEMICAL COMPONENTS AMONG POTTERY SAMPLES FROM A MIDDLE BRONZE AGE SITE IN CALTAGIRONE (SICILY, ITALY)

Author: Tanasi, Davide - University of South FloridaTykot, Robert H. - University of South Florida
Co-Author: Caso, Gianpiero - University of South Florida (Presenting author)
Keywords: Archaeometry, Prehistory, Sicily
Presentation Preference: Poster

The excavations at Sant'Ippolito Hill (Caltagirone, Catania, Sicily) led to the discovery of the most important evidence of Middle and Late Bronze Age settlement in this area. During the excavations, archaeologists located a hut, an area for ceramic storage vessels, and a pottery workshop, all of which provided a large quantity of heterogeneous ceramics with apparent typological parallels in other areas of eastern Sicily. A large number of specimens were selected in order to represent all the macroscopic types and the main classes. The results identified five petrographic fabrics, mostly characterized by abundant tempers, consisting of volcanic rock fragments and occasionally of grog. Only a few samples contained common fine-grained quartz. The aim of this contribution is to present the statistical examination of the data coming from the nondestructive analysis of 30 samples via a portable X-ray fluorescence spectrometer (pXRF). The goal is to explore the chemical composition of local Middle Bronze Age pottery, and then compare it with the data already available for other Middle Bronze Age sites in the Catania territory. Pieces were tested using a Bruker III-SD and samples were analyzed for 120 seconds on both inner and outer surfaces, and on broken edges, using a filter that provides highly precise data for trace elements, such as Fe, Th, Rb, Sr, Y, Zr, Zn, Ga, and Nb. Previous analysis about the samples' chemical composition has revealed the occurrence of two main ceramic groups, identified as low or high calcium content. The high iron content (more than 8.7 wt%) is probably due to the use of temper from altered pyroclastic rocks, while petrographic and chemical results suggest the use of different clays all at once. The data provided by these archaeometric analyses have made a significant contribution to the study of Bronze Age pottery from the Catania area

22 MANAGEMENT OF CULTURAL WORLD HERITAGE SITES IN NATIONAL PARKS. THE CASE OF THE MAYAN CITY OF PALENQUE, MEXICO.

Author: Mr. Vargas, Amilcar - University of Barcelona (Presenting author)
Keywords: Archaeology, UNESCO, Policies
Presentation Preference: Oral

This contribution aims to discuss the complexity in the management of Cultural World Heritage sites in National Parks. UNESCO policies encourage States Parties of the World Heritage Convention to have a proper Management Plan and that authorities of National, Regional and Local levels work together for the protection of the sites in benefit of all humankind. Nevertheless, the strict division in the understanding of cultural and natural heritage as separated topics seems to be replied in the management of several sites all around the world. It has been argued that a comprehensive protection system has to be implemented and transdisciplinary work has to be done to overcome the current management systems. To contribute to this global discussion, this paper will analyse the case of the Mayan site of Palenque, an archaeological site managed by two Mexican Federal institutions. The National Institute of Anthropology and History (INAH) deal with the cultural issues, meanwhile the National Commission for Natural Protected Areas (CONANP) manage the natural resources. Both institutions have Federal competencies, protect exactly the same area and deal with the same local communities and regional and local authorities. However, each of them uses completely different policies to achieve their institutional goals. The research done argues that the complexity of a mixed or more collaborative management system is based on their different priorities, experience, rules of procedures and statutory mandates. These key features are significant limitations for a comprehensive management that could contribute to the preservation of the site as UNESCO policies request. This contribution examined this case using Rapid Ethnographic Assessment Procedures in the years 2014 and 2016.

23 WHAT DOES MARGINALITY REALLY MEAN IN RESEARCH AGENDA? POST-CHALCOLITHIC ÇATALHÖYÜK AND ITS RELEVANCE FOR MARGINALITY UNDERSTANDING

Author: PhD. Student Hordecki, Jedrzej - Adam Mickiewicz Unversity in Poznań, Poland (Presenting author)
Keywords: Çatalhöyük, Post-Chalcolithic, marginality
Presentation Preference: Oral

Çatalhöyük is a well known archaeological site back dated to the Neolithic times. However, thanks to its geographical and geopolitical localization this place also was inhabited in later periods. In particular it was occupied in the Bronze Age, Phrygian, Hellenistic, Roman, Byzantine and Muslim Periods. In all these periods it lost a central position which had in the Neolithic becoming rather local or marginal site.

In my paper I shall present some results of the analysis of Phrygian and Hellenistic periods as a starting point for a discussion the marginality as an aim of research. Firstly I will scrutinize the data reached during excavation. It let me answer the question what information we can really gain from very marginal site. Secondly, I will discuss the methodological possibilities of marginal sites investigation. After the presentation of quite limited data I will try to find the answer for the question in what scale the relations are possible to follow. Especially, questions of the contact patterns and possibly influences from central places.

In the result I shall not only present the new set of data from this marginal site but I will also provide a discussion about what the marginality means to us in a broader context of historical period investigation.

24 THE SETTLEMENT HISTORY OF OBER-RODEN FROM THE EARLY TO THE HIGH MEDIEVAL PERIOD SPECIFICALLY CONSIDERING THE EARLY CAROLINGIAN CONVENT ROTHAHA

Author: MA, HDip, BA Diesch, Aika Katharina - University of Bamberg, Germany (Presenting author)
Keywords: medieval, settlement, convent
Presentation Preference: Oral

Ober-Roden is a district of the city Rödermark in Hesse, Germany. Archaeological excavations took place in Ober-Roden between 1985 and 1997 in the settlement area, inside the current church St. Nazarius and its immediate surroundings – the graveyard and church garden.
Previous studies (e.g.: Leuschner, Schallmayer, 1986; Schallmayer, 2005) and a rough overview of the archaeological artefacts and features recovered assume that the settlement activity dates back to at least the sixth century AD. With that the archaeological evidence reflects an ongoing settlement activity and development from the early medieval until

the modern period. Therefore, Ober-Roden is an exceptional example which allows for a study on a long-term settlement site in the Rhein-Main area connecting ecclesiastical, settlement and population history.
This PhD project ongoing combines an examination of historical sources and archaeological remains in order to research not only the development and expansion of the village, especially concentrating on the early to high medieval period, but also focusing on the convent of nuns Rothaha which is suspected there. The convent Rothaha was first named in the historical sources in 786 when it was donated to the convent Lorsch (Schallmayer, 2005, 145), a UNESCO World Heritage Site (UNESCO, 2017). While much information can already be gained from the historical sources on the convent Rothaha such as for example its sanctification to the saint Nazarius whose relic was kept in the convent Lorsch from 765 onwards (UNESCO, 2017), it is expected that the analysis of the archaeological evidence will permit further conclusions.

Leuschner, J., Schallmayer, E. (1986) 1200 Jahre Ober-Roden in der Rödermark. Chronik 786-1986. Rödermark, 1986.

Schallmayer, E. (2005) 'Beispiel Ober-Roden (Stadt Rödermark). Ein Ort erhält Geschichte. Geschichtsschreibung und Archäologie im Zusammenwirken', Zeitschrift für Archäologie des Mittelalters, 33:145-162.

UNESCO (2017) UNESCO Welterbe Kloster Lorsch. Available at: http://www.kloster-lorsch.de/klosterlorsch/ [Accessed 9 February 2017].

25 ARCHAEOBOTANICAL PERSPECTIVES ON AGRICULTURAL PRODUCTION IN WESTERN IBERIA FROM THE 8TH TO THE 13TH CENTURIES

Author: Tereso, João - CIBIO - Research Center in Biodiversity and Genetic Resources (Univ. of Porto)/Portugal; UNIARQ - Centro de Arqueologia da Universidade de Lisboa (Presenting author)
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Keywords: Archaeobotany, Agriculture, Portugal
Presentation Preference: Oral

It is usually assumed that relevant changes occurred on the agricultural level in the Iberia since the Islamic conquest of Iberia Peninsula in the 8th century. Still, few archaeobotanical evidence was obtained on Islamic sites to document such changes. The aim of this paper is to address Portuguese medieval carpological record to address this question. Despite the particular emphasis on the Islamic archaeological sites, this approach will focus also sites covering all the time span of Islamic occupation period – 8th to 13th century - in order to allow comparisons between different regions, cultural settings. We must stress that Islamic or Christian affiliation is not always clear. Transitional periods and geographic areas of frontier are also considered and are important to understand the complexity of these period in terms of rural strategies
Data from 15 sites will be addressed, including unpublished material from Senhora do Barrocal (Sátão), São Gens (Celorico da Beira) and Mesas do Castelinho (Mesas do Castelinho). There seems to be a North-South difference in the composition of crop assemblages, with a strong predomination of cereals, especially rye (Secale cereale) in Central Portugal and a wider variety of fruits and other non-cereal crops in the South.
Although differences in plant consumption and production may be connected to relevant social/cultural issues, considerations will be made regarding the eventual biases related to sampling strategies and the geographical distribution and chronology of the sites.

26 WALK AND TALK AND CHALK LUDOVIC MCLELLAN MANN

Author: Dr. Brophy, Kenneth - University of Glasgow (Presenting author)
Keywords: Psychogeography, walking, prehistory
Presentation Preference: Oral

The amateur archaeologist, eccentric and showman, Ludovic McLellan Mann, carried out a series of excavations and investigations in and around Glasgow, Scotland, reaching peak intensity between the 1900s and 1930s. This work prompted Mann to propose an occult and prehistoric geometry for a Glasgow before Glasgow, set out in his pamphlet Earliest Glasgow: a temple of the moon. This paper will present a psychogeographical study of Mann's Glasgow, drawing on walks, site visits and creative practice all based on places, routeways and connections Mann viewed as being ancient and powerful, The juxtaposition of these ancient places with the contemporary urban landscape is a key element of my approach, and more broadly I will contribute to the session discussion by exploring the nature of our unfiltered, and uncensored, archaeological encounters of the past in the present.

27 MATERIAL MARKERS OF COMMUNITY IN BURIALS IN SOUTH WEST NORWAY IN THE IRON AGE

Author: Arentz Ostmo, Mari - Museum of Cultural History University of Oslo (Presenting author)
Keywords: funerals identity community
Presentation Preference: Oral

Funerals provide a social arena for the negotiation of alliances and identities as they bring people together to partake in funerary rituals and associated feasting. The study of Iron Age burials from the South West region of Norway reveals different manners in which community is expressed. In this paper I seek to investigate two such forms; the regionally dependent selection of specific types of female jewellery and multi-temporal communities formed through the reuse of burial mounds for secondary graves.
The high visibility and closeness to the body allows jewellery to become statements on display and a medium for creating or negotiating identities both in life and in the context of a funeral. The jewellery found in Iron Age burials consists of both exclusive, high-quality pieces only attainable for the upper elite and simpler brooches attainable for a larger portion of society. Among the latter, a common use of certain types of brooches within smaller regions is here understood as markers of community. By comparing the use of such markers of community across the middle of the first millennium AD, I will address creation and change in communities and shared identity.
The reuse of funerary monuments is a recurring trait in the Iron Age burials of South West Norway. This practice involves both the reuse of Bronze Age mounds as well as mounds constructed in the previous generation. This structured reuse and manipulation of monuments provides a basis for addressing the creation of community through a common history involving the dead, the ancestors and a distant past with the living community that carries out the funeral.

28 UNCOVERING THE SECRETS OF THE PAST COMMUNITIES

Author: Dr. and Consulting Professor Pyrgaki, Marie - Paris I, Pantheon-Sorbonne; Hellenic Open University (Presenting author)
Keywords: Communities, Temporalities, Prehistory
Presentation Preference: Oral

My purpose, in this paper, is to address the concepts of temporality, spatiality and materiality, because they are embedded in discourses of the Past Communities.
This study explores the roots of Past Communities becoming and it uses the notion of becoming draws on Gilles Deleuze and Félix Guattari's (1983, 1987), focusing on the diversity of evidence that can be used to examine how Past Communities come into being both in space and over time.
The notion of becoming with its origins in the Greek philosophy of Heraclitus and Aristotle, in which it is an ontological concept that describes change and movement in opposition to the stasis of being, is fundamental to poststructuralism.
Becoming, which provides a destabilization of being and the structures of power associated with it, is a highly interest concept in Community studies in Archaeology and in theoretical perspectives on the Communities, in general, because of its capacity to provide a way of reconsidering the nature of the Past Communities and Past Communities modification.
In this paper, could we adopt, as Eliot, the theories of Bergsonian time, durée or duration, which presents the world as one "of constant flux, constant becoming without permanence or transcendence" (Gish 1981), qualitative time that is purely subjective in opposition to and with no connection to scientific or chronological time? In the Four Quartets, thanks in part to Einstein, Eliot's conception of time becomes greatly expanded, taking in the full range of human existence, subject and object, from point to eternity. Could we adopt, also, this last conception of time?
This paper will use case studies from the rich Greek archaeological record of Prehistory to illustrate the Community through Temporalities of the Past.

29 THE DANISH METAL DETECTOR FINDS RECORDING SCHEME DIME (DIGITAL METAL DETECTOR FINDS)

Author: Dr. Dobat, Andres - Department of Archaeology, Aarhus University (Presenting author)
Keywords: detector, recording, democratisation
Presentation Preference: Oral

Metal detecting by amateur detectorists in Denmark has contributed to a substantial increase in the number of data and sites and opened new research perspectives. On the other hand, the Danish case is also a tale of missed opportunities because the enormous research potential of the extensive Danish material is substantially under-exploited. Metal-detector finds have paved the way for research on new, previously unknown aspects of prehistoric societies. However, with few exceptions, the finds remain to be fully appreciated as a primary object of analytical archaeological research across regions and individual sites. Today, this appreciation is virtually impossible due to the lack of standardized registration principles and practice as well as a centralized, accessible recording scheme.
Especially when it comes to the recording of metal detector finds, it is in fact the archaeological establishment, which is lagging behind the amateur metal detectorists in many respects. The various initiatives on this field run by members of the metal detector community show that the latter have at least tried to tackle the challenges of the huge increase in finds, and that they have been quick to identify and use the potential of online recording schemes. Hence, Danish metal-detector archaeology has challenged the classic division of roles in archaeology and heritage management, with amateur collectors producing finds but otherwise being more or less passive recipients of the expert knowledge of professional authorities.
Since 2016, a group of museum professionals, detectorists and university researchers have collaborated on the design and implementation of a user-driven recording scheme for detector finds produced by members of the public in Denmark (DIME – DIgital MEtal detector finds). The presentation will focus on the development process and future plans for DIME.

30 A UNIQUE CAVE VILLAGE TURNED MEDIEVAL VILLAGE

Author: Mr. Bhansali, Ketan - Shrimad Rajchandra Prakrit Nidhi (Presenting author)
Keywords: village, Prehistoric, Medieval
Presentation Preference: Oral

The origin of medieval village has been remained difficult to be traced out. In many cases, such villages have been built up on the ruins of the old habitat areas. The clear trace of a medieval village with the pre historic establishment is a rare find. The present study pertains to a unique village site found in India, which provides rich information on transformation process taken place across the globe from pre historic time to medieval time. It has not only preserved its prehistoric structures, but also made use of it from time to time. The well preserved cave structures with clear mapping of the roads and infrastructure of the original pre historic establishment provides rich material for study of development process globally at different time and places. The development of medieval village on the vast canvass of the pre historic structures has many interesting features. The development of medieval village in shape and process is at par with many of the European villages of the particular time scale. The comparative study of the site with medieval European village in context to development process from pre historic time to medieval time provides very interesting clues in many different areas. The study shows many missing clues which can be understood only by the comparative study of villages of Asia and Europe. It also shows the effect of migration and mobilisation across the world

31 ATLANTIC ROCK ART UNDER THE LENS OF DIGITAL TECHNOLOGIES

Author: Valdez-Tullett, Joana - University of Southampton; Historic Environment Scotland (Presenting author)
Keywords: Rock-Art, Digital-technologies, Connectivity
Presentation Preference: Oral

Archaeology is a predominantly visual discipline with a long history of graphically recording its study-objects. Rock art's highly visual character has been explored since early stages, with various methods of illustration, being a great proxy for the development of new recording techniques. Nevertheless, recording rock art can be a highly subjective exercise, due to the character of the evidence. Traditional methods can imprint great levels of subjectivity in the data gathering process, resulting of individual interpretation. Recently, the application of digital imaging technologies to rock art recording has contributed to the acquisition of comprehensive imagery featuring, not only the motifs, but other types of vital information such as the essence of the monuments, their volume, micro-topography, three-dimensionality.
In my study of Atlantic Rock Art I used both photogrammetry and RTI to document the carved rocks featured in 5 study areas located in 5 different countries (Scotland, England, Ireland, Spain and Portugal). The detail provided by the digital models enabled a deeper understanding of the carved iconography and unlocked new avenues of inquiry. Previ-

ously unknown motifs were identified, along with important details that had often been left unnoticed. A better understanding of the rock art's making process and the motif's relationship with the rock surface emerged from these recordings.
In this paper I will explore the application of digital recording techniques applied to Atlantic Rock Art in different contexts and geologies, drawing on results to enhance the contribution of these methods to the understanding of connectivity and cultural transmission during prehistory in Atlantic Europe.

32 POSSIBILITIES OF USING ARCHAEOLOGICAL FINDS IN EXPERIMENTAL WORK ON THE EXAMPLE OF SPINDLE WHORLS FROM RUDA SITE 3-6, GRUDZIĄDZ DISTRICT.

Author: Przymorska-Sztuczka, Magdalena - Institute of Archaeology Nicolaus Copernicus University in Torun (Presenting author)
Keywords: experimental work, textiles
Presentation Preference: Oral

Visions for archaeological finds and its interpretation are as much as archaeologists themselves. I suggest another look at it - as a source of unchangeable metrics, which thanks to experimental work can be reconstructed. I focus on understanding the craft of textiles making in communities inhabiting the present Polish lands in the late Bronze Age and early Iron Age. In the absence of preserved textiles (with few exceptions) only available finds are spindle whorls and loom weights. It takes only 3 lines to describe this category of monuments in almost every publication. It describes only the look and shape of it, quite apart from their weight, which is an overarching parameter. By using the experimental work from this category of monuments we can get much more information. Depending on the size and weight of spindle whorl placed on a spindle were prepared yarn with different properties (thick, thin, twisted tighter or less). The settlement in Ruda provides us almost a full set of evidence (apart from the same very fabrics) of textile production in the late Bronze Age and early Iron Age community. For textile production, the most important is a discovery of 40 spinning whorls (whole and in fragments) and few fragments of loom weights. Experimental work involves the use of original historic spindle whorls, discovered in Ruda, in the process of spinning. Due to this research reconstructed a woolen yarn, which at this settlement was produced, what gives us the opportunity to imagine how the same fabric looked like. In a situation when there is no fabric for research such experimental work make it possible to at least partially restore the appearance of textiles made in prehistory.

33 PHOCEAN COLONIAL CHORA LANDSCAPE IN THE IBERIAN PENINSULA: EMPÚRIES-PONTÓS

Author: Professor Saura, Magda - Technical University of Catalonia (Presenting author)
Keywords: Chora, Empúries-Pontós, Grid,
Presentation Preference: Oral

There is a skeptical debate on whether "chora" is a reliable source for understanding pre-colonialism and colonialism. Traces of the Greek, colonial "chora" survived within the Roman cadaster grid, most of which are still visible today (and still used as vineyards and farming).
Northwestern Mediterranean territories were founded by Phocaeans in a multi-sided frontier region, in ports located in southeast of France and in northeast of Spain. In the second half of the 6th century BC, the area of Empúries-Pontós (Emporion) was founded by Phocean Marseille. Some authors still question that Classical literary sources are not reliable since there is still not enough archaeological evidence to match the stories. Yet pottery does not account only for how the Greeks built cities and the relationships of landscape architecture and regional planning to everyday life (e.g. in cultivated land).. The paper questions prevailing "chora" historiography. New research is being done through architectural drawings and topographical surveys. Furthermore, literary sources have provided to social-economic historians the construct of "neutrality device"; they argue that competition among indigenous people and the Greeks was avoided as a mode of transaction. Port trade was a neutrality mechanism, a derivative of covered trade, of the pre-historic Mediterranean emporium type of city, open to the sea, and to a "neutralized", coastal villages network.

34 THE LONG ROAD TO DOMINATION

Author: Dr NARLOCH, KRZYSZTOF - University of Warsaw (Presenting author)
Keywords: Cavalry, relations, Rome
Presentation Preference: Oral

At the turn of the era, within the militarized and class society of the Roman Empire, a completely new social group appeared. As a result of the new organization of the army, a significant quantity of cavalry units were created that were permanently included into roman forces. Horsemen recruited throughout the Empire formed these culturally diverse and impressive military units, which with time gained prominence and dominated the military landscape during the sixth century.
Analyzing the social relations within these cavalry units as well as the culturally and ethnically diverse units themselves, both at an organizational level and within the wide context of Roman society, it is possible to reconstruct the process of formation and gradual increasing influence of them. This process is also reflected in the material culture in the form of two types of helmets - gesichshelme and ridge-helmets, which elude strict typochronological categorization and whose emergence and increase in popularity were connected with historical events important to the horsemen.

35 THE FINAL DEVELOPMENT OF THE MYCENAEN PALACE AT PYLOS

Author: MA Zeman, Piotr - Adam Mickiewicz University in Poznan (Presenting author)
Keywords: Mycenaen, palace, architecture
Presentation Preference: Oral

The Palace of Nestor at Pylos was constructed shortly after the year 1400 BC, when the older, Early Mycenaean buildings burned down. The new Palace stood until the final destruction of the complex by fire, around 1180 BC. At the moment of destruction, it was a complicated, centralized, bureaucratic structure, focusing on various activities, mainly administration, storage, industrial production and redistribution among dependent personnel. However, it was a result of a long evolution and recontructions, some of which were done quite shortly before the end of the Palace. (Palaima 1986, Wright 1986). In my paper I would like to focus on the problem of relationship between those final architectural changes in the Palace at Pylos and development of local and regional economy and society. Construction of additional rooms and walls enclosing the Palace, together with a reorganization of inner space to create more storage rooms, courtyards and workshops, indicates that the complex was then focused on its economic and social function. This clearly shows a change in the main function of the Palace. New courtyards and pottery pantries were most probably associated with massive feasts, which were the new tool for the elite to strengthen the bonds within the society, becoming also a basic way for a public display of power. (Hruby 2006, Nakassis 2012, Lis 2016). The industrialization and enlargement of storage space on the other hand, could mark the need for centralization and more direct control over the production, maybe also the development of redistribution

system. Those changes led toward a complex, heavily controlled and centralized system of a state organization, which we know from Pylian archives (Shelmerdine 2001, Nakassis 2010). However, the question is how and why this system was created, and that is where a thorough examination of architectural changes within the Palace maybe a key.

36 THE ARCHAEOLOGICAL SURVEY IN DIFFERENT LANDSCAPES: SOME EXAMPLES OF SURVEYS CONDUCTED IN ITALY.

Author: Prof. Mosca, Annapaola - University of Rome (Presenting author)
Keywords: Survey, Italy, Comparison
Presentation Preference: Oral

During archaeological surveys that were carried out in various parts of Italy (in Sicily, on the Island of Pantelleria, in Central Italy and in Northern Italy), different methods of investigation were used, often integrated, connected with the type of land that we had to investigate and with problems encountered on the ground (mountains, rivers, coastal sites, rocky ground) and with the use of soil (e.g. quarries, different crops). However the aim of the archaeological survey was to enable us to identify the archaeological evidence and to reconstruct the features of the settlement in order to rebuild the ancient landscape related to the surrounding area and its environmental characteristics.

37 CATTLE PASTORALISM IN HOLOCENE NORTH AFRICA: POTTERY ISOTOPES AS ECOLOGICAL INDICATORS

Author: Dr Dunne, Julie - University of Bristol (Presenting author)
Co-Author: Professor di Lernia, Savino - Sapienza, Università di Roma; Dr Chłodnicki, Marek - The Archaeological Museum in Poznan; Professor Evershed, Richard - University of Bristol
Keywords: Cattle, Africa, isotopes
Presentation Preference: Oral

Cattle pastoralism has a long history in African cultures. Their social and ideological significance in modern African societies, well beyond their mere function as 'walking larders', is well-established. The remarkable rock art found across Holocene north Africa, together with evidence from mortuary practices and monumental architecture, suggests this relationship may have a long tradition (di Lernia et al., 2013).
To date, molecular and isotopic analysis of archaeological pottery has confirmed that domesticated cattle, used as part of a dairying economy, were present in north Africa from at least the fifth millennium BC. Organic residue analysis can be a powerful proxy both for the mobility of past populations and in discerning the past 'isoscapes' they inhabited (West et al., 2010; Dunne et al., 2012), especially if combined with isotopic study of human and animal remains (di Lernia and Tafuri, 2013; di Lernia et al., 2013). The foods that animals eat exhibit characteristic isotopic signatures (Gannes et al., 1997) and isotopic analyses (δ13C) of fatty acids extracted from archaeological potsherds are therefore a reflection of the consumed diet, providing information about the environment in which the animals foraged.
Here, large-scale molecular and isotopic analysis of potsherds from two Neolithic archaeological sites in the Sahara and Nile Valley (Takarkori, Libya and Kadero, Sudan) are examined in order to infer animal management practices, levels of mobility of the animals exploited and the broader environment as a whole.

38 INTEGRATING DATA FOR A HOLISTIC LANDSCAPE APPROACH TO CHALCOLITHIC CYPRUS: ISSUES, METHODS AND REFLECTION ON RESULTS

Author: Dr. Charalambos, Paraskeva - Postdoctoral Researcher, Department of History and Archaeology, University of Cyprus (Presenting author)
Keywords: Cyprus Chalcolithic survey
Presentation Preference: Oral

The Chalcolithic period in Cyprus is in terms of landscape archaeology one of the best studied and simultaneously least known cultural eras. This paradoxical situation arises from the fact that a small number of multiannual research excavations and intensive surveys in a limited number of regions of the island have brought to light considerable amounts of data regarding this period, but at the same time data from several intensive and extensive surveys that have covered large segments of its surface remain for the most part unpublished, under-studied or poorly published. This disproportionate distribution of data, coupled with the lack of a synthetic study of the period, leads to severe fragmentation of the archaeological record, which in turn inhibits researchers today to explore this period with the methodological and theoretical instruments of landscape archaeology. The current study attempted to redress this imbalance by integrating a broad and in-depth bibliographic study of archaeological publications spanning roughly 90 years with a re-study of the total available survey material from 141 sites across the island. By combining qualitative bibliographic information with quantitative pottery data and assigning levels of information quality, it was possible to partially overcome the fragmentation of the record, assign dates and classify sites by type and size, and begin to explore the island across space and time via spatial analyses. This presentation aims to outline the multiple issues the researcher faces in attempting to tackle complex and highly fragmented record sets, present the methods employed for linking and comparing non-quantifiable and quantifiable datasets, reflect on the lessons learned during the application of the methodology, and finally present the future research avenues for the study.

39 ARCHAEOLOGICAL SURVEY AT MONTE BONIFATO, SICILY

Author: Dr. Balco, William - University of North Georgia (Presenting author)
Keywords: Archaeological Survey, Sicily
Presentation Preference: Oral

Archaeological survey is a method employed by archaeologists worldwide to identify previously unknown sites. This allows for a better understanding of land use and occupation prior to conducting ground disturbing investigations. Site-specific archaeological survey serves as an essential component of archaeological exploration, delineating areas of past human activities on complex multi-component sites. This paper presents the preliminary results of the first season of one such site-specific survey at the Bosco d'Alcamo, the forested summit of Monte Bonifato in western Sicily. This area poses a challenge to archaeologists as Iron Age, Roman, and Medieval occupants have used and modified this landscape intensively. Field methods employed during the survey are presented as well as how these methods were adapted to local conditions, demonstrating the necessity for flexible survey strategies in conjunction with intensive data collection. Furthermore, this paper addresses the balance between collecting high-quality data and survey coverage during short field seasons.

443 THE SIX PILLARS OF SUSTAINABLE HERITAGE

Theme: 2. The Valletta Convention: the next 25 years
Author: Bedaux, Dietske (Netherlands) - Studio LouterBedaux, Dietske (Netherlands) -
Co-Author(s):
Keywords: Heritage management, interdisciplinary, sustainability, spatial planning, stakeholders
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Cultural heritage is a catalyst for sustainable development and contributes to the quality of life. Arcadis has introduced the 'Six Pillars of Sustainable Heritage' model as a vehicle for greater inter-disciplinary work, and to stimulate contributions to sustainable development goals. The aim is to take an integrated approach to the valuation of heritage assets, including archaeology, historic buildings, historic landscapes, non-tangible heritage etc. In addition, the aim is involve heritage as integral part of the planning process, working in close cooperation with design, permitting, ecology, explosives, and cabling, but also with various stakeholders such as the constructor, local associations, and the authorities. Large infrastructural, water, environment and building projects that include planning, design, and construction works, demand an integral approach to heritage management on two levels: inter-disciplinary within the heritage sector, and multi-disciplinary with other aspects and stakeholders in the project. During this session, the integral approach to heritage management will be discussed by means of the case study project of the Noorderburg in Maastricht. The session consists of five presentations on the following topics: 1. Six Pillars of Sustainable Heritage: an introduction 2. Monumental buildings: integrating a casemate in the design of a new bridge 3. Archaeology in a large infrastructural project: fortifications in the Noorderbrug project 4. Environment and archaeology: development of a historical, ecological, and touristic park 5. Stakeholder management and sustainable heritage

444 THE ARCHAEOLOGY OF DEATH (OF BURIAL)

Theme: 6. Interpreting the archaeological record
Author: van Rooijen, Cees (Netherlands) Cultural Heritage Agency,
Keywords: artist, contours, landscape, preparation, rock-art
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

One of the main objects of Archaeology is to reconstruct the history of people and societies. Burials are probably the closest encounters which archaeologists have with those people and their lives. This raises many questions, especially with victims from recent conflicts. This session will explore some of the questions raised and problems encountered.

01 THE PRINCE REVISITED: NEW INSIGHTS ABOUT BURIAL PRACTICE AT NECROPOLIS KAPTOL-ČEMERNICA IN THE POŽEGA VALLEY (CONTINENTAL CROATIA)

Author: Prof Potrebica, Hrvoje - University of Zagreb, Faculty of Humanities and Social Sciences, Department of Archaeology (Presenting author)
Co-Author: Rakvin, Marta - University of Zagreb, Faculty of Humanities and Social Sciences, Department of Archaeology; Archaeological Museum in Zagreb
Keywords: EIA, Kaptol, burials
Presentation Preference: Poster

In 1967 one of Kaptol's most famous princely burials was unearthed in tumulus IV. Rich grave goods, especially imported warrior equipment, made it one of the most important EIA graves in southern Carpathian basin. This discovery initiated further research of the site, which ultimately gave a large contribution to understanding Iron Age communities living on the southern brims of the Eastern Hallstatt circle. It also pointed to Požega Valley, as one of the most important micro-regions in this part of the Iron Age Europe with extraordinary economic power, probably derived from control over inter-regional communication networks.
During the last 15 years, the Center for Prehistoric Research and a team based at the University of Zagreb launched several revision campaigns on Kaptol-Čemernica necropolis, and initiated systematic research of the other necropolis of the same settlement (Kaptol-Gradci). This research of different constructions and grave contexts gave an important insight in complex funerary practices of this community, especially regarding monumental burial structures. Since no such data was recovered in tumulus IV during the 1967 campaign, a revision campaign on presumed location of tumulus IV was undertaken in 2016.
The result was an elaborate structure with a massive wooden burial chamber. Two wooden boxes containing pyre remains were located within the chamber. Furthermore, we managed to locate the excavation trench from 1967, thus establishing a firm contextual frame for further analysis.
This research provided grave context for exceptional finds from tumulus IV which enabled a much better analysis of the inventory, as well as the burial practice. On a larger scale, the discovery of this complex grave architecture, in combination with the other princely burial (tumulus X) and the complex structure with dromos (tumulus III) in its immediate vicinity, raises new questions about their relation.

02 THE STUDY OF THE NECROPOLIS OF VIA XVII, BRACARA AUGUSTA, NW IBERIA: A COMBINED EFFORT OF ARCHAEOBOTANY, ARCHAEOLOGY AND ANTHROPOLOGY

Author: Costa Vaz, Filipe - Research Center in Biodiversity and Genetic Resources (CIBIO) - University of Porto (Presenting author)
Co-Author: Vilas Boas Braga, Cristina - Archaeological Unit of the University of Minho; Miguel Marado, Luís - Archaeological Unit of the University of Minho; Oliveira, Cláudia - Research Center in Biodiversity and Genetic Resources (CIBIO) - University of Porto; Fontes, Luís - Archaeological Unit of the University of Minho; Tereso, João - Research Center in Biodiversity and Genetic Resources (CIBIO) - University of Porto; Martins, Manuela - Archaeological Unit of the University of Minho
Keywords: Bracara, Roman, Archaeobotany
Presentation Preference: Poster

Between 2007 and 2009, excavations in the necropolis of Via XVII in the city center of Braga (Bracara Augusta), northern of Portugal, revealed one of the largest roman funerary complexes in the Iberian Peninsula, with over 190 graves identified, comprising several types (cremation, inhumation and ustrina) and spanning from the late 1st century BC to the 7th century AD. This necropolis would have been one of the main burial areas in Bracara, city founded in the early 1st century AD as the capital of the conventus Bracaraugustanus.

As one of the most important cities in the roman administration of the NW Iberia, it later became the capital of the province of Callaecia and, between the 5th and 7th centuries, capital of the Suebi Kingdom.

A multidisciplinary investigation, combining archaeobotany, archaeology and anthropology, was structured in order to characterize various features of this necropolis. The importance of the city throughout this time frame (almost seven centuries), its location in the periphery of the roman empire as well as the number of grave sites identified, makes the case of the necropolis of Via XVII especially relevant.

This paper will discuss the available data for each refereed field of research, merging the interpretation of the archaeological data (material culture analysis, spacialization, etc.), preliminary anthropological analysis and especially the archaeobotanical data obtained. In regard of the latter, particular emphasis will be made to the characterization and provisioning of fuel and the identification and evolution of funerary practices and rituals of ritual practices associated with its use as well as other vegetal elements found in the site, such as wooden objects and carpological remains.

03 ARCHAEOLOGISTS IN BIAŁA RAWSKA (POLAND) ARCHAEOLOGICAL RESEARCH; CRYPTS; HELPFUL METHODS OF ANALYSIS; EXAMPLES OF OBJECTS

Author: Majorek, Magdalena - Nicolaus Copernicus University in Torun
Co-Author: Ginter, Artur - University of Lodz (Presenting author)
Keywords: Biała Rawska, Poland
Presentation Preference: Oral

Archaeological research in the Wojciech the Bishop and Martyr church in Biała Rawska (Poland) included the presbytery, main nave, sacristy and treasury. Presented burials, buildings, relics, belongs to the period from the fifteenth to nineteenth century. 33 burials in anatomic arrangement and more than 500 artifacts (mainly coins and religious items including 2 fragments of gilded monstrance) have been discovered and documented. We also found the 4 crypts in different state of preservation. In one of them were recorded at least 18 burials in coffins with funerary equipment: garments and devotional objects. Among women's clothing there were preserved fragments of silk dresses, gloves, stockings, footwear. Men's garment was represented by fragments of vests, kontusz sashes, liturgical vestments, footwear.

During the (1st stage) archaeological excavation, we collected 9 brick samples to spectroscopic analyses and optically stimulated luminescence (OSL) dating. Additionally, basic anthropological analysis of the skeletal remains and a card describing the coffin was made. Laboratory work (2nd stage) included the conservation of artifacts and their reconstruction, costumology analysis (using a spectrometer for fabrics with thread with a metal braid), consultations with historians and confrontation research results representatives of different disciplines.
OSL dating allowed the determine the time of building the church and the dating of the various phases of its development. Costumology analysis allowed to reconstruct a fragment of the history of fashion. In conjunction with a form and decoration development line of coffins was characterized modern times elements of the funeral rites.

The use of traditional and new approach to the study of sacral buildings, cemeteries and burials contributed to the full recognition that type of archaeological site and identify the personal details of several people buried in the crypt.

04 SHELL ORNAMENTS IN BURIAL CONTEXTS – NEW APPROACHES TO ASSEMBLAGES FROM NEOLITHIC AND EARLY BRONZE AGE IN POLAND

Author: Dr Kurzawska, Aldona - nstitute of Archaeology and Ethnology Polish Academy of Sciences
Co-Author: Dr Sobkowiak-Tabaka, Iwona - Institute of Archaeology and Ethnology Polish Academy of Sciences (Presenting author)
Keywords: burials, shells, Poland
Presentation Preference: Poster

Burials are perceived as some of the most important records of the human past. As complex features they are exceptional because they tend to preserve material culture better than many other archaeological contexts. Uncovered remains provide important information about past social, economic, symbolic and ideological meaning however they might be also confusing. Through a series of case studies of rich and spectacular finds of shell ornaments from Neolithic and Early Bronze Age burials in Poland we would like to present how the new discoveries influenced our understanding of the past and archaeological interpretation.
Shell ornaments that have been found in Poland at least from the first half of the 20th century attract the attention of scientists particularly in the context of their potentially "exotic" origin. Found far from their sources, they are considered to be the evidence of long-distance cultural relations and trade. In the majority of archaeological reports those finds, are associated with concepts of wealth and prestige. Moreover, it is believed that they played an important part of the Neolithic symbolic system and burial practices. Incorrect scientific conclusions made upon invalid identification of shells and their origin are repeatedly quoted in the Polish and international literature and new ideas are built upon them.
In our presentation based on results from our studies we would like to disenchant traditional way of perception of shell ornaments in the context of burials. Moreover we would like to present possibilities and limits of studies of materials from old excavations and introduce some useful methods to employ while excavating shell ornaments in graves.

05 ARCHAEOLOGICAL TEXTILES FROM PŁONKOWO (POLAND) IN ARCHAEOMETRIC STUDIES.

Author: Ass. Prof Grupa, Malgorzata - Institute of Archaeology, Nicolaus Copernicus University in Torun, (Presenting author)
Co-Author: Dr. Eng. Miazga, Beata - Institute of Archaeology, University of Wroclaw
Keywords: textiles, archaeometry, graves
Presentation Preference: Oral

Archaeological textiles have been usually studied in two ways. One is the analysis of fabric including raw materials and weaves; the other is the examination of decorations on the textiles (e.g. application, metal threads), which need to be investigated by other analytical tools. Archaeometry offers the most appropriate method for the analysis of the latter. Nowadays, non-destructive techniques are very popular, especially for very unique artefacts such as (the) silk textiles from graves. These items can be studied with optical and electron microscopes at various magnification. Chemical analysis, applied to the textiles, has also been made by stereoscopic methods, such as energy-dispersive X-ray fluorescence (ED-XRF) or with the EDX spectrometer combined with a scanning electron microscope.

Flakes of silk scapular with ornamentation made of silk thread with metal braid and fragments of tassels, totally covered with green corrosion products were examined. The scapular was excavated in crypt C, situated in E-S part of the church of St. Oswald in Płonkowo, and the tassels were found in a common grave of ossuary type in the churchyard, functioning there until WW II. Archaeometric studies were applied to give an answer to basic questions concerning textiles and haberdashery with metal braiding from modern times. What product category do they belong to: gold, silver or fake?

06 A PIPELINE THROUGH FLANDERS FIELDS

Author: Mr De Decker, Sam - Vlaamse Overheid, Agentschap Onroerend Erfgoed (Presenting author)
Keywords: Pipeline, WW1
Presentation Preference: Oral

Between Juli 2014 and June 2016 a large scale excavation took place in the western part of Flanders. Direct cause for this research was the planned construction of an important gas pipeline, connecting the port terminals of Dunkirk and Zeebrugge. Constructing the pipeline involved a sequence of operations over a distance of 90km and a working area of 30m wide, all having a major impact on the soil. Apart from expecting a lot of 'regular' archaeological sites, the line cut straight through the First World War frontline, north of Ypres.
The archaeological process started with a comprehensive desktop research, followed by an augering campaign in selected areas. Next step was to select the areas where clear indications for the presence of archaeological sites were found. The excavation of these areas took place before the work on the pipeline was started. For the major part of the route however, it was impossible to use trial trenches or any other invasive method of research prior to the actual construction phase. There was no other option but to organize an extensive watching brief for the remaining stretches of the line.
The pace of work for the archaeological teams was set by the progress made on the pipeline, which was a staggering more than 800m a day. Up to 60 archaeologists were involved, split into smaller teams with clearly set tasks and assigned to well defined areas. This was no unnecessary luxury: the total project yielded over 200 separate archaeological sites. It was hardly possible to treat every single feature with the same high quality standard, but in the end the continuous mutual consultation and collaboration between developer, multiple contractors and archaeologists resulted in a phenomenal increase in the archaeological knowledge of a large area.

07 APPLICATION OF HABITUS-FIELD-THEORY FOR THE ANALYSIS OF BURIAL PRACTICES

Author: MA Benedix, Judith - University of Vienna (Presenting author)
Keywords: agency, burial-practices, habitus
Presentation Preference: Poster

In recent years agency approaches were more and more in the focus of archaeological research. Especially the concepts of doxa an and habitus were widely discussed (Dobres/ Robb 2000, Dornan 2002, Ortner 2001, Smith 2001). The proposed paper will present an approach of understanding burial practices as a specific field following Bourdieu's habitus-field-concept: A field is a setting in which agents and their social positions are located, while the position of each particular agent in the field is the result of interaction between the specific rules of the field. This means in terms of archaeology, that you can discuss every burial as single agent's habitus. The habitus is expressed by the sum of burial features, which can be recorded by archaeological methods. The extent and pattern of all habitus (burials) represents the field (thanatological field), which can be described, analyzed and discussed. The presented approach offers a systematic empirical methodology, based on a well-grounded theoretical framework to study and compare the burial customs over regions and periods and was applied to several case-studies located in Lower Austria (AT) and Moravia (CZ). Preliminary results of two sites (Gars Thunau/ Obere Holzwiese and Břeclav/ Pohansko), which are dated to the Early Middle Ages (9th to 10th century), will be presented.

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Dornan 2002: Dornan, J.L., Agency and Archaeology: Past, Present and Future Directions, Journal of Archaeological Method and Theory 9, 2002, 303–329.
Ortner 2001: Ortner, S.B., Commentary. Practice, power and the past, Journal of Social Archaeology 1, 2001, 271–278.
Smith 2001: Smith, A.T., The limitations of doxa. Agency and subjectivity from an archaeological point of view, Journal of Social Archaeology 1, 2001, 155–171.

08 A CHALLENGE WITHIN A CHALLENGING CONTEXT: INTERPRETING GENDER IDENTITIES IN THE BURIAL RECORD

Author: MA Venderbos, Ilona - Vrije Universiteit Amsterdam; CLUE + (Presenting author)
Keywords: Burials, Identity, Gender
Presentation Preference: Oral

This paper presents the research which the author conducts in the context of a PhD dissertation, the aim of which is to investigate the relation between redefinitions of gender identities and the profound socio-political, economic, cultural and ideological transformations from roughly the 10th to the early 6th century BC in Latium Vetus. Since burials are the principle source of information on identity in this phase, funerary archaeology is the discipline to study this question.
One of the main challenges for this research is to identify and interpret the available evidence in the burials under study, with full appreciation of the complexities of both gender and identity and in a context which has its own restrictions for addressing questions on social issues. One might risk falling into pitfalls such as the implicit equation of sex and gender, stereotyping, or not considering the intersection of gender with other types of identity. Furthermore, objects themselves are no simple reflections of identities; through agency, objects are dynamic and actively involved in the construction, perception and negotiation of these identities.
Recent methodological and theoretical insights from gender archaeology provide very helpful tools to overcome such pitfalls. Of prime importance is to acknowledge the social construction of both sex and gender, but also the development of statistical methods for connecting patterns in grave good assemblages to gender. Using funerary data from Latium Vetus as a case-study, this paper not only critically discusses these recent insights, but also illustrates how such notions can be practically applied to actual mortuary data. Moreover, special attention is paid to how practical application of these notions can refine existing reconstructions of gender identities and offer new interpretations.

09 STRONTIUM ANALYSES OF HUMAN BONES FROM THE SOUTHERN SUBURB OF THE EARLY MEDIEVAL STRONGHOLD BRECLAV – POHANSKO (CZECH REPUBLIC)

Author: Mgr., Ph.D. Prichystalová, Renáta - Masaryk University (Presenting author)
Co-Author: Mgr., Ph.D. Kalová, Katerina - Masaryk University; Mgr., PhD. Boberová, Katerina - Masaryk University
Keywords: Pohansko, Strontium, Migration
Presentation Preference: Oral

In 1960-1962, 1975-1979 and 1991-1994, 205 graves were unearthed in the southern suburb of the medieval stronghold Breclav – Pohansko (Czech Republic). The excavated area sized ca. 9 ha represents about 40 % of the presumed total area of the suburb.
The graves were scattered either isolated, by twos or threes, or in small discrete groups within the settlement component. The spatial arrangement of funerary areas and variety of burial practices indicate a culturally, religiously and maybe ethnically mixed community.
Modern research on population buried in the southern suburb during the 9th century involved standard information sources extended by natural-scientific analyses of skeletal material: isotopes (Sr – migrations), DNA (sex determination), histology, MicroCT, X-ray (health, pathologies), radiocarbon analysis (dating). The conference paper will be focused on results of strontium analyses, which confirmed the assumption of a mixed community.

10 JOINED UP ACCESS TO EUROPEAN FINDS DATABASES

Author: Professor Richards, Julian - University of York (Presenting author)
Keywords: Finds, databases, interoperability
Presentation Preference: Oral

Following the success of the Portable Antiquities Scheme in England and Wales there has been a flowering of online systems designed to capture information about archaeological finds made by members of the public – in Northern Europe and Southern Scandinavia. Such projects can make a important contribution to capturing important data for archaeological research at national level. However, for most periods of archaeological interest modern political borders are irrelevant. Whether we are studying population movement, trade, manufacture, or the diffusion of ideas, we need access to data sets which transcend modern boundaries. ARIADNE is an EU-funded e-infrastructure of European archaeological data providers and information scientists whose aim is provide integrated access to archaeological data for European researchers. This paper will present the ARIADNE online portal, discussing some of the challenges of integrating data sets described in different languages and according to national or regional subject vocabularies and period terms, and it will show how these are being overcome. It will seek to demonstrate the potential of ARIADNE as a research tool for those undertaking European finds research.

11 EVIDENT AND HIDDEN SOCIAL INEQUALITIES IN THE BRONZE AGE ITALY. A BIOARCHAEOLOGICAL APPROACH

Author: Dr. Cavazzuti, Claudio - Durham University (Presenting author)
Keywords: Italy, BronzeAge, Terramare
Presentation Preference: Oral

The variability of mortuary rituals in the Bronze Age across Italy is striking and, thanks to the recent advances in bioarchaeological research and methods, we have now a clearer picture of how the societies developed in the transition from village communities to proto-urban centres.
Taking into account the best-known contexts from Northern Italy and the peninsula, this presentation will focus on the social inequalities observable in the archaeological record. While the hierarchical structure of the society is already distinctly visible in the Middle Bronze Age collective hypogea of the South-East (i.e. Trinitapoli and Toppo Daguzzo), the adoption of cremation in the Po Plain (Terramare) tends to hide the existing differences among groups and individuals, implying for us a stronger analytical effort to achieve the objective. Although we observe a general trend towards a stratified society, the time and the modes of this process significantly vary through time and space, also in consequence of the "foreigner" influences (the Myceanean from South and the Tell cultures from the North).
Beside the traditional archaeological and osteological approaches, still essential for a reliable overall interpretation, the isotopic evidence of diet and mobility patterns will be part of the discussion.

12 LUXURIOUS AND POOR GRAVE CHASUBLES OF PRIESTS BURIED IN THE CRYPT OF THE HOLY VIRGIN MARY'S CHURCH IN SZCZUCZYN, POLAND.

Author: PhD student Grupa, Dawid - Institute of Archaeology, Nicolaus Copernicus University in Torun (Presenting author)
Keywords: graves, priests, context
Presentation Preference: Oral

The monastery complex was founded by Stanislaw Antoni Szczuka at the end of 17th c for the Piarists Order, which cared for it and managed the property until the Order dissolution in 19th c. First inventory and clearing works were undertaken in 2012 to estimate the research frames. Two crypts situated under the church presbytery contained remains of local nobles, the founder's family members and the representatives of the Order. Preliminary examination showed that a part of bodies underwent natural mummification, thanks to which a rich collection of grave gowns, both lay and liturgical has preserved till now. Particular groups of archaeological objects were studied by a team of archaeologists, anthropologists and historians. Grave liturgical vestments of priests and monks were separated as a single collection of source material. In the course of detailed analyses of textile samples belonging to particular coffins and verification of written sources, the researchers succeeded in revealing many interesting facts concerning the Order and the monastery complex functioning. One of fascinating problems referred to differences in making various chasubles and textiles used for making them. Detailed analyses depicted, how political and economic changes influenced on quality of used fabrics, designed for preparing grave attire in accordance with the Church regulations. The information was confirmed in letters to donors and inventory lists of the monastery. Archaeological explorations in similar locations deliver much precious information, but only after comparing it to historical sources, we are able to present a complete historical picture of a place. Thanks to interdisciplinary research, it is possible to locate excavated burials not only in archaeological context, but also outline influences of historical events on life and death of single representatives of various social groups.

13 PATTERNS AND HETEROGENEITY IN MATERIAL CULTURE: MORTUARY IDENTITIES AND SOCIAL SPACES IN NUBIAN COLONIAL CEMETERIES

Author: Mr Lemos, Rennan - University of Cambridge (Presenting author)
Keywords: Assemblage, Identity, Colonialism
Presentation Preference: Poster

The numerous objects found within burials and cemeteries have long served as the main basis for the interpretation of Egyptian and Nubian mortuary data. At the same time, on Nubian ground, the shift from Nubian C-Group material culture to Egyptian-styled objects has been seen as evidence of the "Egyptianisation" of Nubian populations during the colonial period (the New Kingdom). Current approaches to contacts between Nubia and Egypt have emphasised agency and cultural entanglements at a variety of contexts. However, a "trickle down" perspective on cultural reproduction is still adopted to interpret object patterns found in colonial cemeteries in Nubia. I aim to ask how material culture provides ways of creating identities and other models of society. My emphasis relies upon an understanding of objects' potential for 'becoming' different things in different contexts. I argue that patterns identified in material culture may be interpreted as evidence for heterogeneous cultural creations and diverse negotiations, from which various modes of existence arise. This is especially significant in a context of colonisation, where different models of society clash with one another. By reassembling some of the multiple links between objects in assemblages in Nubian colonial cemeteries, my aim is to trace heterogeneity of cultural meanings and negotiations of identities (both hierarchical and heterarchical) in object patterns.

14 THEORETICAL-METHODOLOGICAL MODEL TO STUDY VULNERABILITY OF DEATH IN THE PAST FROM A BIOARCHAEOLOGICAL APPROACH

Author: Ph.D student Granados Vazquez, Geraldine - Escuela Nacional de Antropologia e Historia (Presenting author)
Keywords: Bioarchaeology, Frailty, Vulnerability
Presentation Preference: Poster

Every human being is exposed to the risk of dying with some being some of them are more susceptible than others. Thus, the cause could be due to hazard die that a group or individual faces, making this unavoidable hazard the condition of vulnerability. This research is focusing specifically on building a model that evaluate the risk or propensity of death in past urban societies in connection with the everyday life of individuals, considering that death can be a consequence of two coexisting issues: hazard and the deterioration of the resistance to death.
This theoretical and methodological model proposes four areas to assess vulnerability. The first three areas use statistical methods or quantitative analysis, while the fourth area, which corresponds to the embodiment, is based on qualitative analysis. The four areas proposed are:
a) Demographic dynamics. From here, four aspects may be inferred: population structure, fertility, mortality-survival, and productivity-migration.
b) Frailty. Selective mortality and heterogeneity in frailty can be assessed through the relationship between characteristics and the age at death. There are two indicators used in contemporary populations to evaluate stress: height and linear enamel hypoplasias.
c) Inequality. Space reflects various sectors of society in ancient cities. Thus, the spatial analysis uses measures of association to show the relationship between frail variables and space.
d) Embodiment. Everyone's history leaves skeletal evidence. This has led us to consider the dynamics of individuals in terms of time and space; in others words, the micro-analysis of individuals.
To conclude, using urban Mesoamerican examples as a case of study, this research demonstrates that not only the intrinsic characteristics related to the age and sex of individuals are conducive to vulnerability, but also the social and historical context that determines their state of frailty before death.

15 THE LITTLE SCALPED WARRIOR FROM BURIAL OF SARYG-BULUN (VI-VTH CENTURIES B.C.): UNSOLVED PROBLEMS AND POSSIBLE APPROACHES TO STUDY

Author: (current PhD. Student) Busova, Varvara - Institute for The History of Material Culture (Presenting author)
Keywords: mummy, SEM, isotope
Presentation Preference: Oral

In 1988 Scythian burials Saryg-Bulun on the right bank of the Ulug-Hem river, not far from Bayn-Kol settlement were excavated in Tuva (Southern Siberia) by Vl.A. Semyonov and M.E. Kilynovsky (Semyonov, 1992: 121). This mound belongs to Aldy-Bel culture and dates back to the VI-Vth centuries B.C. The burial contained the body of a youth in a wooden box the naturally mummified. The burial also contained his clothes – leather trousers, coat and weapons (puncheon, arrows, bow and quiver). His head was devoid of his skin and near by him was found the cap from leather with a red ornament. Through the scanning electron microscopy we know that his coat made from the fur of jerboas (Chernova, Busova, 2016: 52). Isotopic analysis of a bone tissue and his skin can help us to learn what belongs to the leather of his cap and what belongs to his own mind. And after we can talk about his diet before his death.
At the early stage (Aldy-Bel culture) of Scythian time in Tuva, we don't have almost serial specialized military burials of young warriors. Only on the next stage (Uyk-Sagly culture, V-IIth centuries BC), the number of military burials increased and it can be connected with the differentiation of society of Central Asian nomads.
Not always we can use the data of natural-scientific methods of research to make results give us historical insights. How can we use data to understand who was this young warrior and why his head was left a scalp?

References:

Semyonov Vl.A. Military burials of early nomads in Tuva // Археологические вести. - Санкт-Пете161рг, 1992, вып. 1. 1. 116-125
Chernova O.F., Busova V.S.. Identification of fragments of fur clothes from kurgans of the Scythian period of Central Tuva // Археологические вести. - Санкт-Петербург, 2016, вып. 22. С. 52-61

16 EARLY ENEOLITHIC MORTUARY PRACTICES FROM ALBA IULIA-LUMEA NOUĂ (TRANSYLVANIA, ROMANIA). COMMINGLED OR COLLECTIVE BURIALS?

Author: Dr. Gligor, Mihai - 1 Decembrie 1918 University of Alba Iulia (Presenting author)
Co-Author: MSc Lundberg, Christina - Independent reseacher
Keywords: Commingled/Collective Burials
Presentation Preference: Oral

In the past 15 years, rapid residential development of the city of Alba Iulia (Romania) has resulted in multiple rescue excavations at the Lumea Nouă settlement, one of the most important Neolithic and Eneolitic archaeological sites from Transylvania.
Until now, five distinct funerary complexes with commingled human remains discovered at the site has been excavated. The pits and ditches/ burials (?) contained mostly articulated skeletons belonging to children, adolescents and adults of both sexes, but also disarticulated remains. Blunt force trauma to the skull was clearly observed in several cases. The Lumea Nouă assemblage currently comprises at least 96 individuals.
The 20 AMS dates available, indicate that these unusual funerary practices took place around 4500 BC.
The aim of this paper is to present the archaeological context of these burials and to discuss differences and similarities from a bioarchaeological point of view. The interpretation of the variation in burial practices includes defleshing, secondary burial, war situation and ritual practices.

17 URNFIELD GRAVES AS MEANINGFUL COMPOSITE ARTEFACTS

Author: Louwen, Arjan - Leiden University (Presenting author)
Keywords: Urnfield funerary practices
Presentation Preference: Oral

The tens of thousands of urnfield cremation graves on shelves in museums, archives and archaeological depositories, together constitute one of the most prominent funerary legacies from prehistory in Europe. Despite their abundance, the funerary rituals reflected in these graves and the ideas these may represent are so far only poorly researched and understood. Probably because of their sheer numbers, widespread distribution and complex research history, the research into urnfield graves lacks comprehensive studies dealing with the many actions and choices involved in the compositions we have come to know as urnfield graves.

A case-study dealing with some 3000 cremation graves dating between 1300 and 400 BC from the Northwest European Plain however shows that a multi-angle analysis of these graves is indeed evident in our understanding of these seemingly simple burials. By combining osteological analyses, material culture studies and stratigraphical information the study revealed several reoccurring traits in the composition of urnfield graves that seem to hint at wide shared ideas about the notion of the (dead) person across the research area and most probably beyond.

This paper will present the most important methodological aspects and results of the research and will argue that urnfield graves should be regarded as meaningful composite artefacts indeed.

18 EVIDENT AND HIDDEN SOCIAL INEQUALITIES IN THE BRONZE AGE ITALY. A BIOARCHAEOLOGICAL APPROACH

Author: Dr. Cavazzuti, Claudio - Durham University (Presenting author)
Keywords: Inequalities, Bioarchaeology, Mobility
Presentation Preference: Oral

The variability of mortuary rituals in the Bronze Age across Italy is striking and, thanks to the recent advances in bioarchaeological research and methods, we have now a clearer picture of how the societies developed in the transition from village communities to proto-urban centres.
Taking into account the best-known contexts from Northern Italy and the peninsula, this presentation will focus on the social inequalities observable in the archaeological record. While the hierarchical structure of the society is already distinctly visible in the Middle Bronze Age collective hypogea of the South-East (i.e. Trinitapoli and Toppo Daguzzo), the adoption of cremation in the Po Plain (Terramare) tends to hide the existing differences among groups and individuals, implying for us a stronger analytical effort to achieve the objective. Although we observe a general trend towards a stratified society, the time and the mode of this process significantly vary through time and space, also in consequence of the "foreigner" influences (the Mycenaean from South and the Tell cultures from the North).
Besides the traditional archaeological and osteological approaches, still essential for a reliable overall interpretation, the isotopic evidence of diet and mobility patterns will be part of the discussion.

19 EXTRAORDINARY FIND OF THE DOUBLE, WARRIOR GRAVE FROM PRZEWORSK CULTURE BURIAL SITE, IN PAKOSZÓWKA, VOIV. PODKARPACKIE, POLAND.

Author: M.A. Bulas, Jan - Jagiellonian University (Presenting author)
Co-Author: Dr Kotowicz, Piotr - Historical Museum in Sanok
Keywords: Double warrior burial
Presentation Preference: Oral

The paper will concentrate on the discovery of the rich Przeworsk Culture grave, found on the only second known burial site from the Upper San basin, located in the Polish Carpathians. The find is worth separate presentation as it was so called "double grave" with two full weapon inventories, including i.a. two swords, four spearheads, two shield bosses as well as many other objects suggesting roman influences. Such graves are uncommon in Barbaricum and very rarely two full weapon sets are found in the one burial. Moreover, most of that kind of graves, known from the Przeworsk Culture are dated to the Pre-Roman Period while the grave 1 from Pakoszówka is dated to the turn of Early Roman Period and Younger Roman Period. The other evidence is the anthropological analysis that suggests that two individuals were buried in the grave. The discovery corresponds well with the recent funeral finds from the territory of the East Slovakia. Together with the finds from the Upper Tisza basin, it indicates the migration of the Przeworsk culture population to the areas bordering the Roman Empire in this turbulent time and the special role it played in the events of the end of second century A.D.

20 EARLY ENEOLITHIC MORTUARY PRACTICES FROM ALBA IULIA-LUMEA NOUĂ (TRANSYLVANIA, ROMANIA). COMMINGLED OR COLLECTIVE BURIALS?

Author: Dr. Gligor, Mihai - 1 Decembrie 1918 University of Alba Iulia (Presenting author)
Co-Author: MSc Lundberg, Christina - Independent reseacher
Keywords: Commingled/Collective Burials
Presentation Preference: Oral

In the past 15 years, rapid residential development of the city of Alba Iulia (Romania) has resulted in multiple rescue excavations at the Lumea Nouă settlement, one of the most important Neolithic and Eneolitic archaeological sites from Transylvania.
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The Lumea Nouă assemblage currently comprises at least 96 individuals.
The 20 AMS dates available, indicate that these unusual funerary practices took place around 4500 BC.
The aim of this paper is to present the archaeological context of these burials and to discuss differences and similarities from a bioarchaeological point of view. The interpretation of the variation in burial practices includes defleshing, secondary burial, war situation and ritual practices.

21 THE LITTLE SCALPED WARRIOR FROM THE BURIAL OF SARYG-BULUN (6TH-5TH CENTURY B.C.): UNSOLVED PROBLEMS AND POSSIBLE APPROACHES TO STUDY

Author: (current PhD. Student) Busova, Varvara - Institute for The History of Material Culture (Presenting author)
Keywords: mummy, SEM, isotope
Presentation Preference: Oral

In 1988 the Scythian burials of Saryg-Bulun on the right bank of the Ulug-Hem river, not far from the Bayn-Kol settlement were excavated in Tuva (Southern Siberia) by Vl. A. Semyonov and M. E. Kilynovsky (Semyonov, 1992: 121). This mound belongs to the Aldy-Bel culture and dates back to the 6th-5th century B.C. The burial contained the naturally mummified body of a youth in a wooden box. The burial also contained his clothes – leather trousers, coat and weapons (puncheon, arrows, bow and quiver). His head was devoid of skin and a leather cap with red ornaments was found nearby him. Due to a scanning electron microscopy we know that his coat was made from the fur of jerboas (Chernova, Busova, 2016: 52). Isotopic analysis of bone tissue and his skin can help us to learn what belongs to the leather of his cap and what belongs to his own head. And after we can talk about his diet before his death.
At the early stage (Aldy-Bel culture) of Scythian time in Tuva, we have almost no serial specialized military burials. At the next stage (Uyk-Sagly culture, 5th-2nd century B.C.), the number of military burials increased and it can be connected with the differentiation of Central Asian nomad societies.
Unfortunately, at present, the data of natural scientific studies do not always apply to give us historical insight. How can we use this kind of data to understand who this young warrior was and why his head was left without a scalp?

References:

Semyonov Vl.A. Military burials of early nomads in Tuva // Археологические вести. - Санкт-Петербург, 1992, вып. 1. С. 116-125
Chernova O.F., Busova V.S.. Identification of fragments of fur clothes from kurgans of the Scythian period of Central Tuva // Археологические вести. - Санкт-Петербург, 2016, вып. 22. С. 52-61

445 MEDIEVAL BUILDINGS: CONNECTIONS AND TRADITIONS

Theme: 5. Comparing Archaeology Across Regions and Periods
Author: Sarah Kerr - Katholieke Universiteit Leuven, Antoinette Huijbers - Independent Researcher
Keywords: connections, traditions, typologies, society
Presentation Preference: Session, made up of a combination of papers, max. 15 minutes each

Two concepts are central to this session, connectivity and tradition. Buildings can be viewed as materialisations of connections between medieval people and other: not only the physical relationship such as utilitarian requirement and material, but subtle connections to the landscape, economy, and objects. Connectivity stresses relationships of influence between individual buildings and other agents (human and non-human). Buildings could be studied in isolation, but also in relationship with other buildings. The concept of tradition is of relevance here. Tradition emphasizes the importance of culture and commonality, whether in a bounded area or in a network. 'Tradition' could be applied in a static sense, but in a dynamic sense as well. Buildings are connected to each other; studies on particular typologies reveal the social and practical requirement for a type, why and how it was created. They connect to earlier structures and societies through the remnants in their fabric and reuse of material. Tradition in a dynamic definition is applicable here, tradition as a process (as a verb). Tradition also has a spatial dimension. Buildings across the continent are connected through similarities. In this respect tradition in a static sense is of concern (as a noun). This session invites papers discussing how buildings were inextricably connected to medieval life. Papers which focus on a single building, building type or region but are outward looking to a wider context are welcomed.

01 MEDIEVAL BUILDINGS: CONNECTIONS AND TRADITIONS

Author: Dr Kerr, Sarah - Katholike Universiteit Leuven (Presenting author)
Keywords: typologies, buildings, connections
Presentation Preference: Oral

Introduction the Session

02 BUILDING TRADITION AS A VERB. PEASANT ARCHITECTURE AD 900-1300 IN THE NORTHWEST EUROPEAN PLAIN

Author: Dr Huijbers, Antoinette - independent researcher (Presenting author)
Keywords: buildings, tradition, actor-networks
Presentation Preference: Oral

How and why did buildings develop during the Middle Ages? How could this process be studied using the concept of building tradition? What approaches are of use to achieve this aim, according to our current state of knowledge? In this paper an approach is chosen with at its core the diachronic interplay between 'individuality' and 'commonality' on the one hand, and the concepts of continuity and change on the other. 'Building tradition' could be considered as a verb as well as a noun. Building tradition as a verb is defined, after Bronner, as a process of sharing and learning ideas, skills, buildings and building features. Building tradition as a process of sharing and learning interacts with individual building processes. To study the individuality of building processes and buildings the (post-) Actor-Network Theory of Latour is very appropriate, as will be argued. To combine Bronner´s concept of building tradition with Latour´s theory however a few necessary steps have to be taken. Both analytical tools have to be defined in relationship with each other. To study the development of buildings and building features however, both analytical tools to study commonality and individuality have also to be defined in connection with continuity and change. Individual building processes for example, by introducing innovations from sources nearby or far away, could lead to change of shared skills, building features and/or building appearances.
The application of this approach will be exemplified by a case study. The case study aims to understand the development of peasant houses in the North West European plain during the Central Middle Ages (AD 900-1300).

03 THE AGENCY BEHIND BUILDING TRADITIONS – MEDIEVAL AND EARLY MODERN URBAN BUILDING IN SOUTHERN SCANDINAVIA

Author: Mr Thomasson, Joakim - Lund university (Presenting author)
Keywords: Urban domestic architecture
Presentation Preference: Oral

In this paper the concept of building tradition is defined as the network of actors involved in the field of building. It is argued that the appearance of buildings is settled by negotiations between three basic positions in these fields.
The case study for the discussion is the development of the medieval and early modern urban domestic architecture in southern Scandinavia. Practising this definition, three contemporary and competing building traditions have been identified. The paper explores the relations between the different building traditions, and how the actors used their power positions to influence the architectural outcome as well as to gain and maintain social status.

04 CENTRAL CASTLE TOWERS AND THE HAMAR BISHOPRIC: MEDIEVAL BUILDINGS, SOCIAL CONNECTIONS AND CONTEXTS IN SCANDINAVIA

Author: Mr Reinfjord, Kristian - Anno Museum (Presenting author)
Keywords: Castle, Tower, Bishop
Presentation Preference: Oral

In Medieval Hamar, situated in Eastern Norway, the bishopric was founded in 1152/3. The residence of the Hamar bishop, built in the 13th century, is one of 16 ecclesial castles/residences built under the archbishop of Nidaros in medieval Norway. These castles are found throughout Norway, but also on Man, Iceland, Orkney, and Greenland. Strong connections between the Nidaros archbishop and the bishops suggest close connection and resemblance in their residence architecture. However, varying layouts and architectural features of the residences show different influences. Central castle towers, as found at Hamar, are very rare architectonical elements in medieval Norway. Such central towers are for instance found throughout Sweden, where 8 of 25 castles connected to bishops have towers. Specific features of medieval architecture, such as a central tower, can show connections across regions and periods in medieval society. As Krautheimer has shown, different features and building details can have played a vital role in the medieval conception of architecture, and the symbolic significance of a tower could be prominent and carry different connotations. Immaterial aspects of architecture and copies of building features brought from one region to another are seen as materialization of social connections. Often, an archaeological record can imply relationships which are vague in written sources. By mapping connections in the central towers' iconographical architecture, date, placement, fabric, and daily use, the proposed paper suggests that a stronger connection with Sweden, than from the Nidaros archbishop, can be seen in the archaeological material at Hamar.

05 EARLY GOTHIC IN THE MIDI; THE BENEDICTINE ABBEY OF PSALMODI

Author: Associate Professor Riorden, Elizabeth - University of Cincinnati
Co-Author: Associate Professor Tilman, Jeffrey - University of Cincinnati (Presenting author); Associate Professor Riorden, Elizabeth - University of Cincinnati
Keywords: Gothic, monastic architecture
Presentation Preference: Oral

The appearance of Gothic building elements in Southern France is a complex process, not a simple narrative of the expansion of the power of the kings of France in the region. Likewise, the region had multiple traditions and did not act as a block; economic competition was intense and some rose while others faltered. For the religious establishments in the Midi, tradition was important and wrapped up in identity and claims of legitimacy. Tradition had to be acknowledged, but the rise of the Cistercians presented certain challenges to the Benedictine order; the church hierarchy needed new ideas as well as tradition. Master builders, unlike abbots, were free to follow projects from region to region, and thus became agents of innovation.
The Benedictine abbey of St-Pierre-de-Psalmodi in the Rhone delta presents an informative case study of these complex processes. Founded in the Carolingian period on an island in the marshy lagoons of the Camargue, the site was already occupied by a cemetery and possibly a funeral chapel built of wood or other organic material. The 9th C church appears to have venerated a pre-existing tomb, and in turn, the late 12th C church project replicated several features referring to the older building. At the same time, there is a new synthesis of early Gothic experiments with regional Romanesque traditions.
The Carolingian period had shown a new type of "global" freedom in the exchange of ideas, but it did not last. Three hundred years later, there seems to be a new widening of exchange with ideas flowing from all directions; it is possible that buildings in Languedoc (Psalmodi and related churches) could become models for buildings in the Oise valley (St-Jean-aux-Bois, for example), following the mobility and expansion of reform monastic movements and even royal patronage.

06 THE MANY FACES OF AUTHORITY: CASTLES, POWER CENTRES AND THEIR LANDSCAPES IN THE LORDSHIP OF GALLOWAY, SCOTLAND, 12TH-14TH CENTURIES.

Author: Mr. Wyeth, William - University of Stirling & Historic Environment Scotland (Presenting author)
Keywords: Castles, Scotland, medieval
Presentation Preference: Oral

The villainous Galwegians of medieval chronicle fame have in the past three decades been banished from critical historical discussion. More nuanced research has sought to frame the emergence of independent Galloway and its incorporation in the Scottish Kingdom over the course of the 12th to 14th centuries in terms of the regional politics of the Irish Sea zone and the Anglo-Scottish interface. Certainly the castles of the Lordship of Galloway which have been the subject of recent surveys and nuance to this more sober image of the region's medieval past. This paper aims to examine a selection of castle sites in the Lordship and add to the picture a consideration for their landscape, examining specifically settlement (through place-name studies) and the larger socio-economic environment. It considers what three different physical forms of power centre – a crannog (Lochrutton), a castle (Turnberry) and a settlement (Kirkcudbright) – might suggest about Galloway's emergence and transformation over the 12th-14th centuries

07 'MISFIT' CASTLE FORMS OF THE IRISH SEA: CROSSING THE NORTHERN ANGLO-WELSH BRIDGE

Author: Dr Swallow, Rachel - Independent Scholar (Presenting author)
Keywords: Castles Irish Sea
Presentation Preference: Oral

The Irish Sea Cultural Zone, and its nature and extent, was proposed for the first time in my article published in July 2016 in The Archaeological Journal, entitled, 'Cheshire Castles of the Irish Sea Cultural Zone.' The evidence relating to the siting and form of the zone's castles was analysed through a landscape history and archaeological study, which spans - and thus bridges - many disciplinary boundaries. My research highlighted that within the Irish Sea Cultural Zone, rather than the generally typified form of earthwork motte-and-kidney-shaped bailey castle, there were instead two distinctive and arguably 'misfit' forms of castle earthworks. These 'misfits' were mottes with rectilinear baileys, and mottes with no baileys, and both forms were seemingly peculiar to the area of both present-day west Cheshire in north-west England, and present-day north-east Wales.

As argued in my 2016 article, it is probable that these two unusual forms of castles represent a continuity of form from prehistoric, Roman, or Anglo-Saxon monuments to Anglo-Norman castles. This is reflected in the continuity of purpose in control over communications within Cheshire, focussing on the county's capital at Chester. However, the wider geographical context of the northern Anglo-Welsh border—that is, North Wales—was also a significant economic, social and defensive component of the Irish Sea region. It would thus be logical to assume that the same continuing significance of military and social influences on the siting of the castles in medieval west Cheshire also applied throughout the whole of the Irish Sea region. Therefore, undertaking the same research approach of building multidisciplinary bridges as employed for Cheshire, this paper will discuss and interpret to what extent, if at all, the newly identified phenomenon of 'misfit' castle forms extended beyond west Cheshire and the Irish Sea Cultural Zone, and thus into Gwynedd and Powys in North Wales.

08 ACROSS THE SEA – URBAN BUILDING CULTURE IN THE SOUTHERN BALTIC REALM

Author: Mr Thomasson, Joakim - Lund university (Presenting author)
Keywords: Urban building culture
Presentation Preference: Oral

Towns were established along the southern Baltic coastlines from the end of the 12th and 13th centuries. The reasons behind urbanisation differed. Colonisation was definitely a driving force along the southern coastline, whereas societal change and state formation were more defining for the development in southern Scandinavia. Demographic growth, a rising number of people and networks involved in trade activities in combination with an increase in missionary activities and a firm clerical organisation, permeated the area as a whole.
Urbanisation differed in size and pace. When for example Lübeck and Stralsund quickly became huge towns, the Scandinavian counterparts on the other side of the Baltic stayed relatively small. These differences apart, there were notable similarities in the architecture. Most notable is the period from the 14th to the middle of the 16th century.
This paper explores the reasons behind the common features within the architecture and how these similarities were maintained. But importantly, the paper also discusses why the urban architecture after the middle of the 16th century developed in different directions along the southern and northern coastlines.

09 SCOTTISH MEDIEVAL WINDOW GLASS: EUROPEAN CONNECTIONS

Author: Spencer, Helen - Centre of Excellence in the Built Environment (Presenting author)
Keywords: window glass medieval
Presentation Preference: Oral

Unlike most countries in Europe there is no surviving High Medieval window glass still in situ in monastic or ecclesiastic buildings in Scotland. Apart from two roundels, in the Magdalen Chapel, Edinburgh, all in situ window glass was destroyed during or shortly after the reformation in 1568. The only window glass remaining has been excavated from the archaeological record.
This work is the first major study of the composition of high medieval window glass used in Scotland. A total of 250 glass shards from 13 sites across Scotland, typologically dated to between the 13th – 15th Centuries were analysed by Scanning Electron Microscopy – Energy Dispersive Spectrometry (SEM-EDS) and portable X-ray Fluorescence (p-XRF). Trace elements for fifty of these samples were investigated using Laser-ablated Inductively Coupled Plasma mass spectroscopy (LA-ICP-MS). Chemical composition of Scottish glass has been compared with similar scientific studies of window glass from England, Ireland and Western Europe. The analysis has shown that the glass is likely to have been imported from a range of manufacturing sites across Europe, with clear regional and chronological differences. For example, the composition of window glass from the monastic sites of Elcho nunnery (Cistercian) and Perth Blackfriars (Dominican) are similar to each other but significantly different to the glass from the ecclesiastical sites of Elgin and St Andrews. Different colours of glass are likely to have been products of specialist regional production sites. The paper will discuss the proposed networks of importation and the connections between the different ecclesiastical and monastic orders inferred from the choice and supply of window glass from Europe.

10 THE LATE MEDIEVAL GAELIC SECULAR BUILDINGS OF ULSTER: WHERE ARE THEY AND WHAT DID THEY LOOK LIKE?

Author: Miss Patrick, Laura - Queen's University Belfast (Presenting author)
Keywords: Medieval Gaelic Buildings
Presentation Preference: Oral

'Scorched Earth' policies that prevailed during the Nine Years War (1594-1603) largely resulted in the wholescale destruction of much of Ulster's Late Medieval Gaelic building stock. The destruction of these buildings stemmed from the fear that the opposition could occupy a geographically strategic site, thus gaining the military advantage. As a result, these tactics were employed by both the English and Irish armies. Therefore, archaeologists are presented with an enormous challenge when it comes to interpreting the nature of these buildings, their location, and the materials used in their construction. While stone and mortar were used for tower houses and churches, the importance of carpentry and timber buildings has tended to be overlooked, along with the typical building style that seems to have been adopted by the vast majority of the population: post-and-wattle or sod-walled structures with cruck-roofs. These buildings leave little by way of an archaeological signature on the modern landscape and it is often only through the chance discovery during archaeological excavation of their hearths and drip gullies that such structures can be identified.
This paper then seeks to address the challenges associated with the identification of Ulster's Late Medieval Gaelic habitation structures, highlighting the potential avenues of investigation available to counteract the dearth of physical information. The development of Geographical Information Systems has been instrumental in the increased detection of these invisible buildings, by allowing a more in-depth interrogation of historic landscapes, tying together a wide range of proxy sources. These include; LiDAR; aerial photography; infrared; place name research; environmental analysis; and historical investigation.
How then, does the situation in Ulster compare to further plantation areas in Ireland? Munster, for example, has an extensive surviving network of Medieval and Early Modern stone structures. Why, during the Munster plantation did they survive, but those of Ulster did not?

11 PUTTING THE CART BEFORE THE HORSE: THE CHANGING APPEARANCE OF MEDIEVAL FARMSTEADS

Author: Mr Berryman, Duncan - Queen's University Belfast (Presenting author)
Keywords: Farmstead, Medieval, Buildings
Presentation Preference: Oral

The manorial farmsteads of medieval England were reasonably similar in appearance and layout across the country. These buildings reflected the agricultural specialisation of the manor and made use of local building materials. However, in the post-medieval period, the appearance of the farmstead changed and the agricultural buildings were concealed from sight. This paper will explore the changes that occurred in the agricultural landscape and seek to explain why they occurred. Did the meaning or importance of the buildings change? Was there a change in the position of animals in society? When did these changes occur? This paper aims to develop some thoughts briefly expressed in the author's PhD thesis and hopes to provide some answers to these questions.

12 ARCHITECTURAL TRADITIONS OF PRE-ROMANESQUE CENTRALLY-PLANNED CHURCHES IN BOHEMIA.

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Keywords: Churches, Central Europe
Presentation Preference: Oral

Centrally-planned churches, particularly rotundas, represent a significant proportion of the earliest Christian sacral architecture in Early Medieval Bohemia. Due to the distinctiveness of this architectural type, early rotundas in Bohemia have attracted attention from art historians and archaeologists since the 19th century. Consequently, they became the general research topic for my PhD project.
Past generations of scholars supposed the distribution of centrally-planned churches reflected international networks of the emerging Bohemian State. Herewith, they aimed to find the origins of the architectural traditions of the Bohemian centrally-planned churches as to trace the courses of Christianisation. The debate concerned primarily the controversy between their origins in the "West" (Carolingian Empire, Bavaria and Saxony) or in the "East" (together with the Slavonic mission of Cyril and Methodius from the south Slavonic regions, transmitted through the Great Moravian Empire to Bohemia).
In the presented paper, I will firstly aim to summarize the antecedent discussion. Whilst following the development of the discussion, I want to analyse how far that "West vs. East" debate was influenced by the contemporary social and political background. Moreover, I will trace the scientific approaches of the predecessor scholars, which were mostly based on the detailed analyses of architectural forms of individual buildings. In the other part of the presented paper, I want to explain the approach I will be applying in my PhD thesis to contribute this discussion. In my approach, I want to analyse not only the forms/ appearance, but also the functions/ content of individual churches in relevant regions. Finally, I would like to discuss this approach with the audience and present the statements from my PhD research.

13 CONNECTING CULTURE AND ARCHITECTURE: THE USE OF CULTURAL TRAITS TO INTERPRET ECCLESIASTICAL STRUCTURES IN BYZANTINE LYCIA

Author: Ms Scardina, Audrey - University of Edinburgh (Presenting author)
Keywords: Cultural-Traits, Architecture, Churches
Presentation Preference: Oral

The aim of my research is to consider the Late Antique and Byzantine churches of Lycia as structures made and used by the communities that surrounded them. While previous studies consider aspects of human interaction, they often do not consider these structures as artefacts in their own right. Recently, archaeologists have begun to use the theory of cultural transmission though analysing cultural traits, a process which is predominantly employed when analysing high numbers of easily reproducible artefacts. While the process may not be exactly the same for ecclesiastical structures, it is still possible to break down the church into cultural traits, such as: building material, addition of features, and geographic location. This makes it possible to identify cultural trends across the study area, while keeping in mind the actual physical location of the church in a wider archaeological landscape.

In this paper, I will use this approach to test well-known hypotheses regarding the purpose and style of church architecture. One example of such is the debate around the purpose of the triconch or trefoil apse: Does it relate to the 6th century St. Nicholas of Holy Sion, who lived in the mountains where most triconch apses are found? What might this tell us about their appearance elsewhere in Lycia? I will also consider the temporal nature of these structures: how did the patterns of building, and types of building change

over time? Do the results play into the thesis of seventh-century decline, or do they contradict it? Ideally, these results will provide a new way of thinking about architecture: not as types but as cultural products of the communities they reflect.

14 ON THE QUESTION OF THE METHODOLOGY OF DESCRIBING BYZANTINE MASONRY IN THE NORTH BLACK SEA REGION

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Keywords: Byzantine masonry, classification
Presentation Preference: Oral

Stone wall is perhaps one of the most commonly found categories of building remains which scholars studying Byzantine archeological sites have to deal with. The use of stone and brick "ornaments" was inherited from the Romans, but only in the 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. The ornamentation of facades, represented by combinations of various stone and brick masonries, is rightfully considered an original distinctive feature of Byzantine architecture. However, these combinations may vary depending on region, which as a rule, serves as a factor used to distinguish local architectural schools. There is a whole number of scientific works describing characteristics of varieties and areas of use of particular stonework. But while in the Byzantine capital and central provinces they have been described and classified quite well, the empire's northern circumference remain outside the scholars' field of view. And therefore, local construction traditions of the Northern Black Sea region deserve closer attention.
Besides that, description of stonemasonry remains in a number of cases is still, as a rule, far from being exhaustive, and sometimes, does not reflect the reality at all. The explanation is that the methodology used by various scholars to characterize stone structures lacks systematic and clearly established, generally-acceptable order. And therefore, a possible way out of this situation is the large-scale implementation of a uniform method of describing stonework for this region. Such kind of method will be described in our paper presented at the conference.

15 THE ARCHAEOLOGICAL SITE OF LOS HITOS AND THE RURAL LANDSCAPE OF TOLEDO (SPAIN) IN LATE ANTIGUITY (6TH -8TH C.)

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Keywords: LateAntiquity, Landscape, Architecture
Presentation Preference: Oral

This works aims to present the current state of the art of fieldworks and the excavation carried out during the last three years in a large late antique both residencial and funerary building located at Los Hitos (Orgaz, Toledo, Spain). The goal is also to communicate the new results from recent archaeological digs that are developed in the summer of 2016 and the next works during 2017. The site of Los Hitos is a relevant rural and sacred complex related to the local elites of the Visigoth capital of Toledo. The Regnum Gothorum in the Iberian Peninsula was consolidated since the middle second half of the 6th c. An ambitious cultural and legislative programme, perfectly elaborated, was set into action in order to reach the new unification of ancient Roman Hispania. The complex of Los Hitos is one of the best rural case studies in the Iberian Peninsula about changes of cultural landscapes. The site had undergone many transformations regarding functions and architectural spaces from his foundation as rural privileged residence, mausoleum, ecclesiastical complex, and it continued being occupied during the Umayyad period.

16 HOME IN THE HILLS: THE BICULTURAL VIKING AGE FARM-SITE AT THE BRAAID, ISLE OF MAN

Author: Dr Steinforth, Dirk - Independent Researcher (Presenting author)
Keywords: Man, Settlement, Vikings
Presentation Preference: Oral

In the late 9th century, Vikings conquered the Isle of Man in the Irish Sea and settled there among the native Celtic population, introducing their own traditions and culture. At the settlement site at the Braaid a direct indicator to the manner of the relationship between both groups appears to be visible.
The remains of three stone buildings, each in about the same state of ruin, are standing in close proximity to each other. One of them is a large hall with massive, bowed walls in obvious Scandinavian style, the other a smaller rectangular house with straight walls. But the third is a roundhouse in just as unequivocally Celtic building tradition.
This correlation has often been interpreted as settlement continuity, of a Viking settler taking over a Manx farm – by force or by peaceful means – and then built his own home his own way. A lack of archaeological material makes interpretation very difficult, but some architectural details in both house types suggest the possibility of interethnic collaboration. Certainty, however, must remain elusive.

17 RUINS OF SZER - CHALLENGES RAISED BY THE PARTIAL RECONSTRUCTION OF A MEDIEVAL MONASTICAL BUILDING COMPLEX ON THE HUNGARIAN PLAIN

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Keywords: monastery medieval benedictian
Presentation Preference: Oral

The Szer monastery, once a religious centre of high local importance in the medieval Kingdom of Hungary became a ruin by the end of the 16th century. The once mighty church ended up as a lair of bandits before its almost complete final destruction by locals. Early archaeological investigations in the second half of the 19th century came hand in hand with contemporary rituals of nationalistic and mithological thinking. Whilst the excavations of the next century became far more professional, the newly unearthed ruins became the centerpiece of a national memorial park.
This complex situation presents challenges concerning partial reconstructional plans. How can pictorial representations, international paralels and local archaeological data be used to create a scholarly correct partial reconstruction of a 12-13th century building complex?

18 THE CONSTANT GEOMETRY: THE ABSTRACT ORDER OF LATE ROMAN AND BYZANTINE CONSTANTINOPLE

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Keywords: Byzantine, Cityscape, Geometry
Presentation Preference: Oral

Byzantine art like Roman art - and many related artefacts - was in the public use predominantly religious or symbolical. This is not necessarily visible.

The Roman, Late Antique and Byzantine cityscapes are in important cities – like Rome and Constantinople – an act of art. The city is in the Byzantine case an icon, an image of order that make no difference between the divine structure of cosmos and the imperial order on earth. The icon-city structure is symbolical of both. The elements are buildings and monuments.

The geometrical relation of the elements is fixed from the point of view of location, and does not necessarily change from Roman to Medieval civilization. Elements may change in form, material, size, technology, style, dominance, complexity, references of representation, dimensionality, pictorial technique, location and function. But the totality is remarkably constant.

In this paper I will argue that these buildings, monuments and connected ceremonies are related to the 5th century urban pattern even in Medieval times.

The overall pattern of Constantinople as I first presented it at IBC 1986 (Washington DC; Georgetown university 1986) , CIHA 1986 (Washington DC; Penn State Press 1989) and in Figura 1989 (Uppsala) was archaeologically verified by Albrecht Berger (Istanbuler Mitteilungen 1997; DOP 2000). It seems however to have had a lasting impact on much later structures in Constantinople. I discuss these processes at the EAA 2015 (Glasgow) and IMC 2017 (Leeds).

In spite of a distinct change from corporeal memorial columns to two-dimensional representations in later floor mosaics we recognize the reference to a geometric system never abandoned, although buildings become simplified and more referential. Further excavations will hopefully clarify the total picture. New technologies in digital visualization of buildings and topography are important tools for understanding patterns never intended to be visibly present, but ruling.

19 EXCAVATIONS OF THE KÖNIGSBERG CASTLE IN 2016

Author: Khokhlov, Alexandr - Institute of Archaeology Russian Academy of Sciences (Presenting author)
Keywords: Königsberg castle
Presentation Preference: Oral

The Königsberg castle (now it is a city of Kaliningrad) was founded in 1255. West wing in a Renaissance style and towers of the castle were constructed in 1584-1591. The castle was ruined in 1944-1945 and later its ruins were taken apart.
Archaeological excavations of 2016 under the guidance of A. Sivolapova and A. Khokhlov in 1789 sq.m. area were held on the territory of the west wing.
A basement of the north-west tower of 2,5 meters high and mortared bond of bricks and boulder were revealed. Bricks of the XVI century were 29 x 14 x 8 - 31 x 13 x 7 cm in size. Bricks from demolished old walls were used as well. The tower foundations were based on wooden stilts drowned in clay along with gothic foundations made out of broad boulders fastened with clay.
The occupation layer of the XIX-XVIII centuries was mixed and contained early findings like silver coin with a portrait of Albert of Brandenburg, a key with laced head and amber bead as well. A level containing ceramics of Order period without late materials was revealed under which there was another level containing moulded ceramics except for kitchenware made using pottery wheel. An occupation layer on the slope of old hill represented by remnants of settlement located on so called King Mountain before the castle was constructed was revealed in 2016.
Old Stuttgart Castle constructed a little earlier had the most alike analogies to the west wing of the Königsberg castle in building stacking plan. Similar architectural and construction concepts can be found in castles constructed in a Renaissance style in Holland, France and Sweden as well.

20 IRON FASTENERS PARTS OF VELIUONA CASTLE

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Keywords: Nails, medieval buildings,
Presentation Preference: Poster

Veliuona former Teutonic Order castle or the second hill-fort of Veliuona was established in the Nemunas River valley, in Jurbarkas vicinity, in southwestern Lithuania. This was a motte type castle which constituted of two nearby hills. In 1337 here lied nameless Teutonic Order castle. It was formed of two buildings. This fort had a function to block Grand Duchy of Lithuania castles in Veliuona.
During archaeological excavations of this castle in 1965, a 1,3 m cultural layer with abundant charcoal, stones, bricks and various metal tools was found. Between numerous findings more than 900 10–30 cm length iron nails, hinges, and sheathings.
During the archaeological material studies one of the main aim was to determine these iron parts types and their adaptability. Considerable attention was given to nails heads types determination, and preparing of their measurement methodology. It was noticed that nails length played very important role. Straight nails, as well as bended ones, shows what kind of thickness planks were used in the constructions. The measurements allows to sort out and separate what kind of nails was chosen for the different work. The presenting data will allow to compose an overview about the use of iron in the buildings construction of Medieval Lithuania.

21 THE HARTENŠTEJN CASTLE: PRACTICAL APPLICATION OF LATE MEDIEVAL DEFENSE WORK

Author: Mgr. Kuchařík, Milan - Labrys o.p.s. (Presenting author)
Keywords: Latemedieval, castle, defence
Presentation Preference: Oral

In the years 2014 - 2016 a rescue archaeological excavation took place together with the reconstruction of a small castle Hartenštejn near the town of Bochov in western Bohemia. In cooperation with building history research we have gained new knowledge about the development of the castle, founded in the mid. of 15th century, and about the function of

every of the castle buildings. Hartenštejn Castle in the Czech Republic is a unique example of late medieval defense system using firearms. The builders of the castle were the lords of Plauen, who brought to Bohemia (probably from Saxony) a modern and previously unknown defense elements. However some of them have apparently only a symbolic function judging by their location.

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